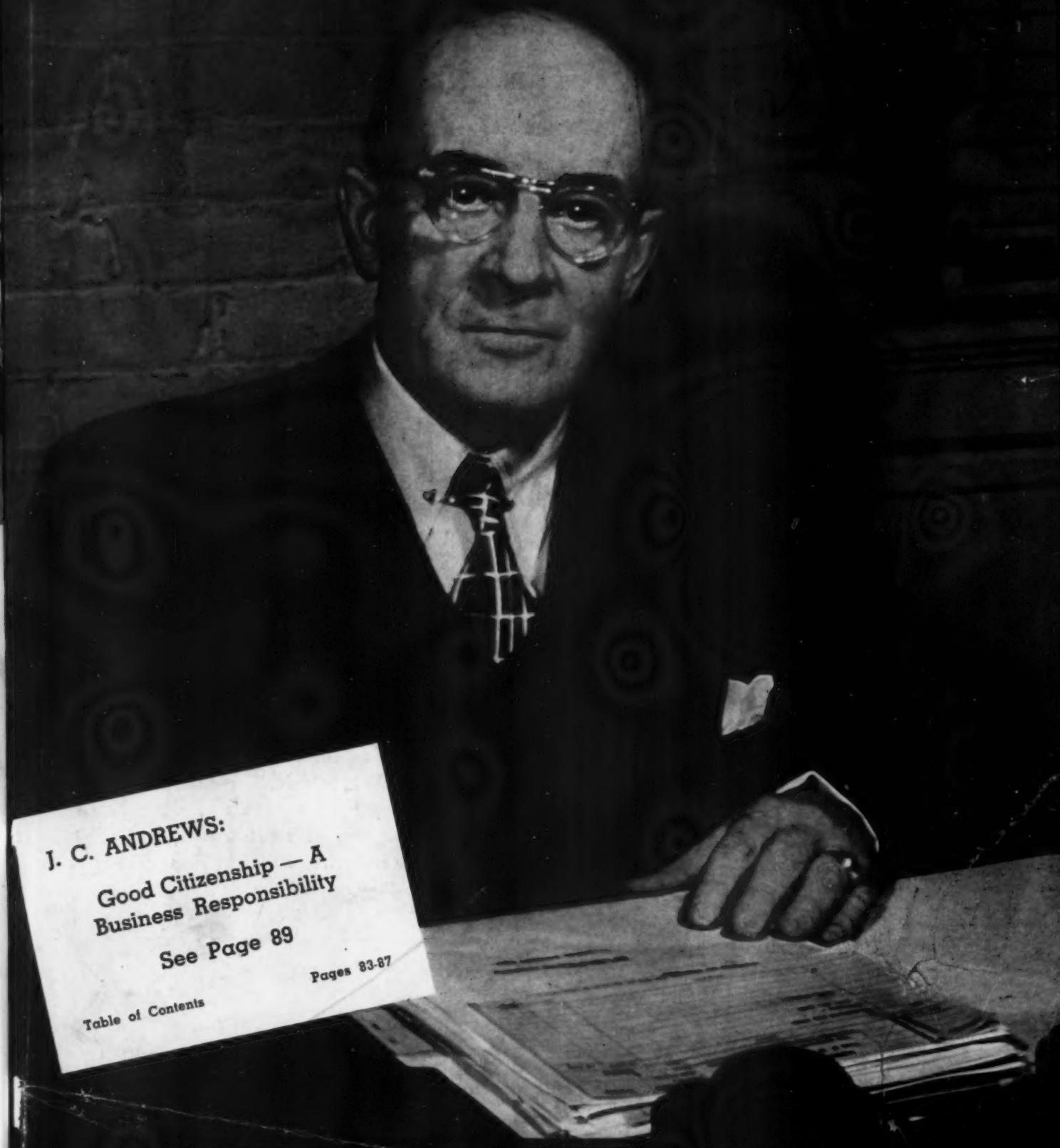


PURCHASING

SEPTEMBER, 1948



J. C. ANDREWS:

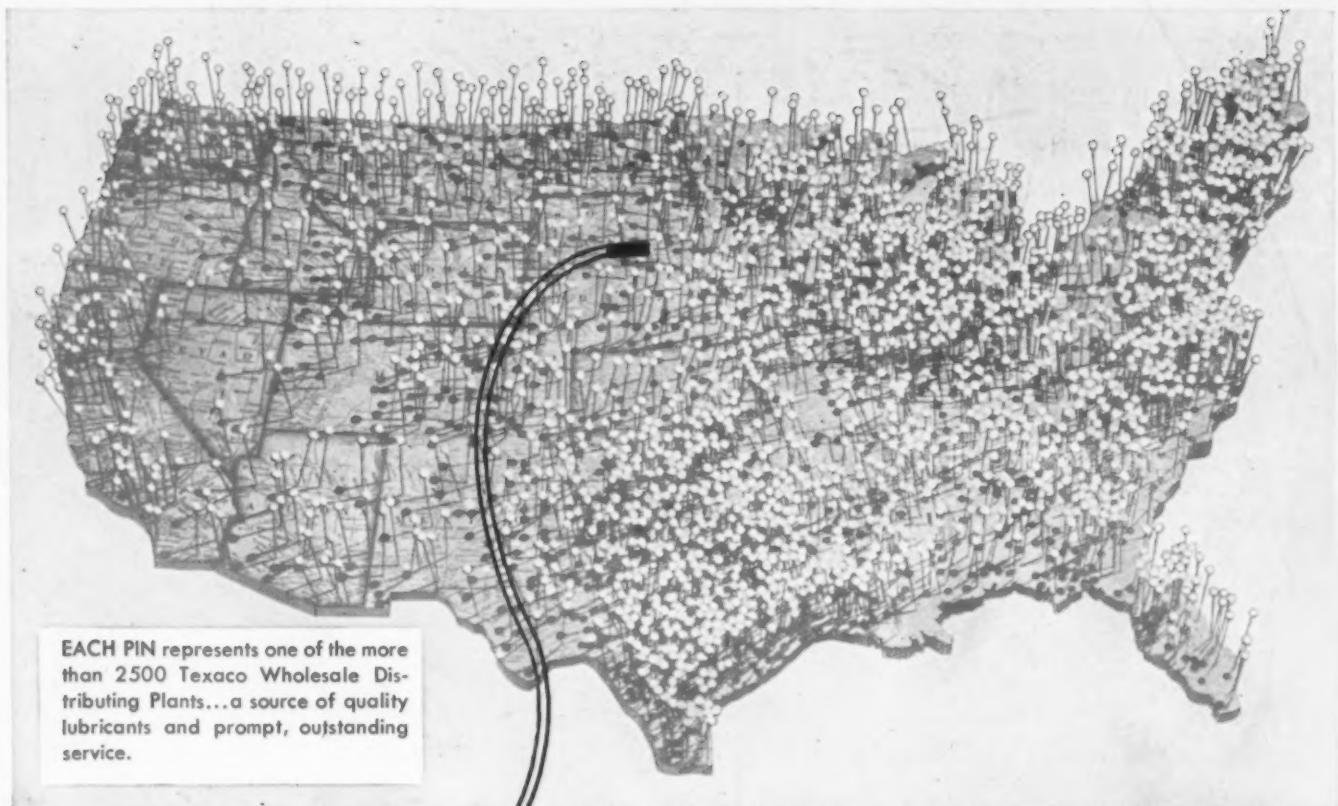
Good Citizenship — A
Business Responsibility

See Page 89

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Pages 83-87

A CONOVER-MAST PUBLICATION • 50 CENTS



WHEN your telephone operator connects you with your local Texaco Wholesale Distributing Plant she is, in effect, plugging you in on the entire Texaco "lubrication network" shown in the illustration.

Behind the prompt, efficient response to your needs is the lubrication know-how gained through

PLUG IN ON A TRIPLE GAIN

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- " ② improved quality
- " ③ reduced costs

through Texaco Lubrication Engineering Service—nation-wide experience to help you, wherever located.

Texaco's long experience with industry in all 48 States . . . in all types of plants, large and small.

Texaco has quality lubricants for every need . . . and a Texaco Lubrication Engineer will help you use them properly to increase efficiency and economy throughout your plant. Put your call to Texaco in today...or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

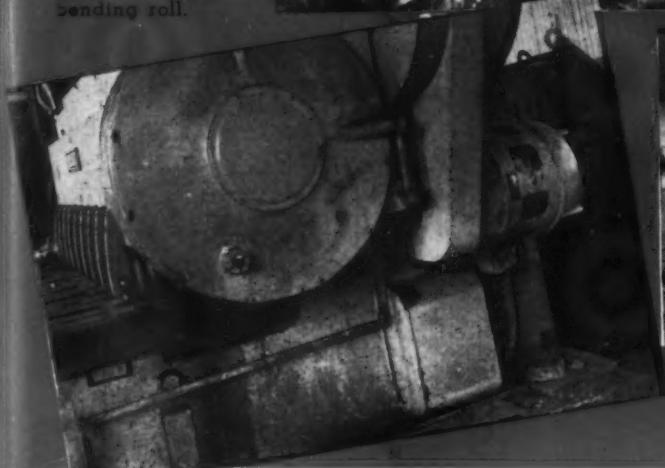
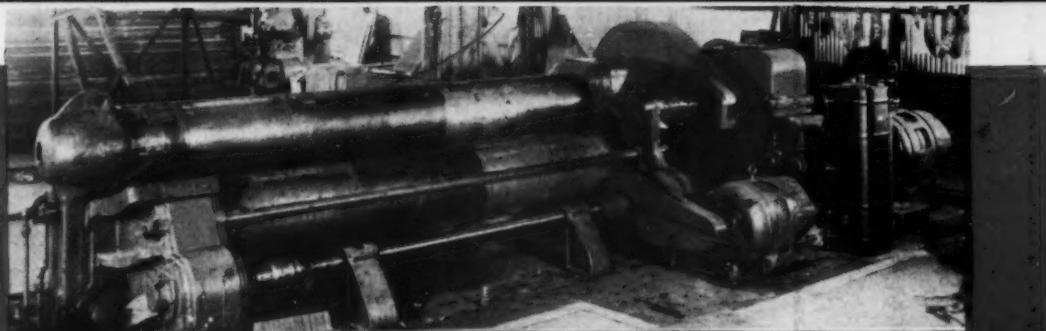


TEXACO Lubricants, Fuels and Lubrication Engineering Service

Tune in...Texaco Star Theatre every Wednesday night featuring Gordon MacRae and Evelyn Knight...ABC Network

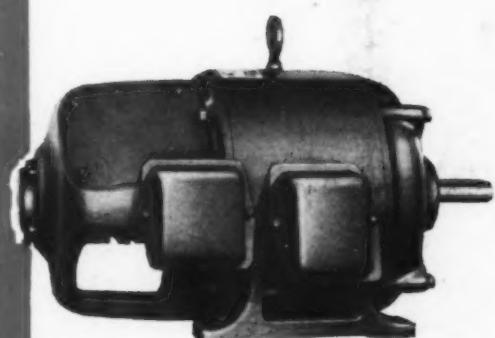


Supply Variable Speeds — Century 75 and 30 horsepower Slip Ring motors permit a range of speeds and reversing direction of rotation—to meet changing load requirements of this bending roll.



Provides Smooth Continuous Power — Century 2 horsepower SC motor supplies power for this steel cutoff saw.

Cushions High Impact Loads — Century 40 horsepower SCT motor slows down, cushions the impact of shearing or forming.



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The three applications shown here are typical of the many types of machines for which Century motors supply dependable power—day after day.

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PURCHASING, published monthly, by PEEAYE, INC., subsidiary of CONOVER-MAST PUBLICATIONS, INC. Publication Office, Orange, Conn. Editorial and Executive Offices 205 East 42nd St., New York 17, N. Y. Entered as second class matter August 8, 1942, at the Post Office in Orange, Conn., under the act of March 3, 1879. Subscription rates: United States, U. S. Possessions and Canada, \$4 per year, \$7 for two years; elsewhere \$6 per year, \$11 for two years. Single copies 50c. Volume XXV, No. 3.



Strategic Location — Faster Service

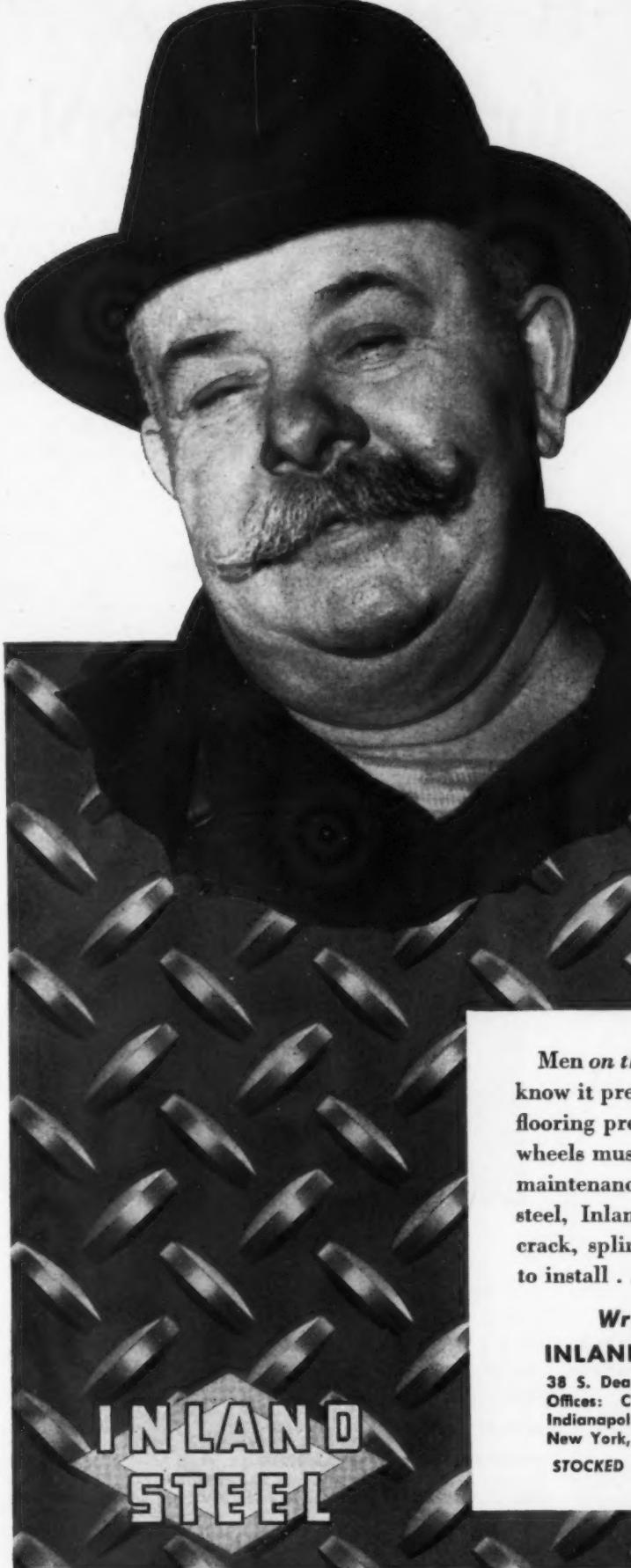
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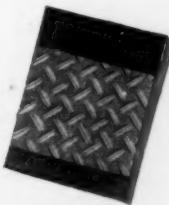
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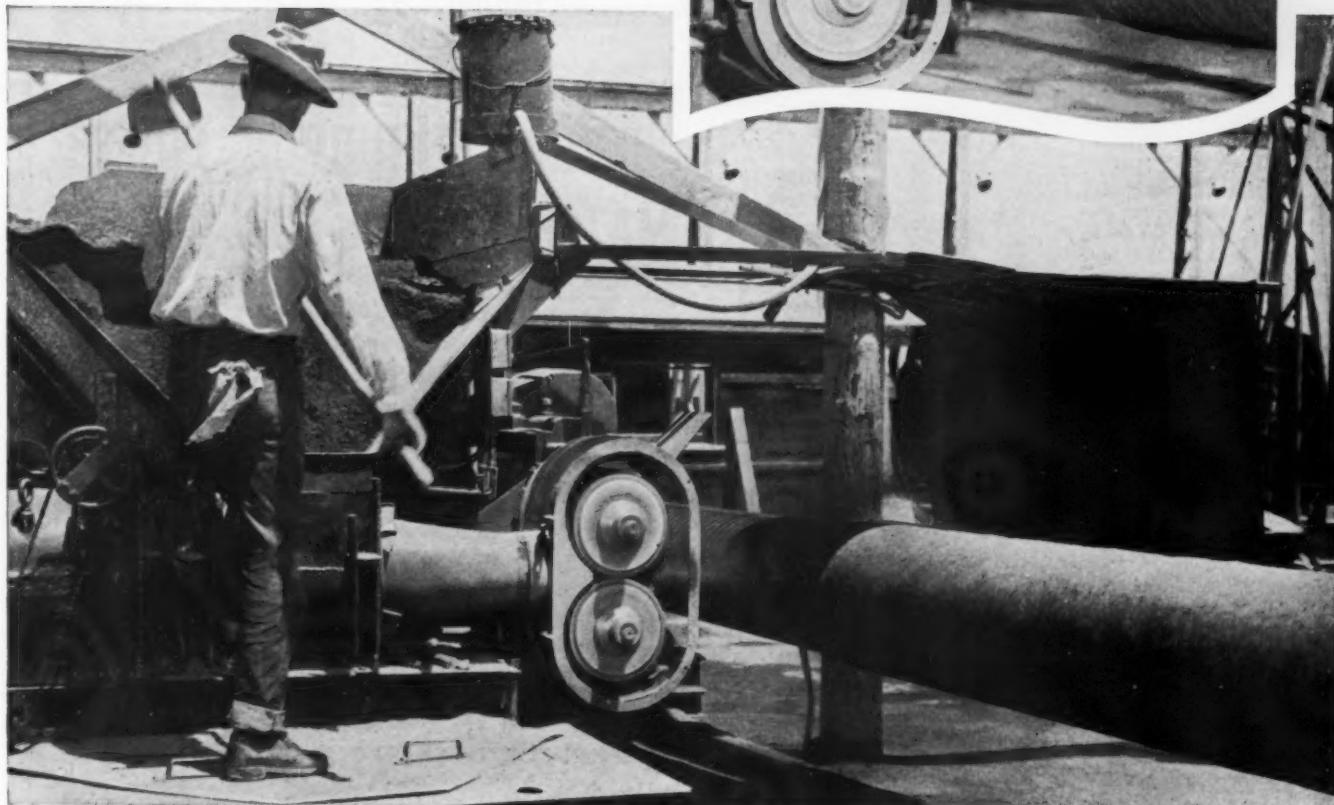


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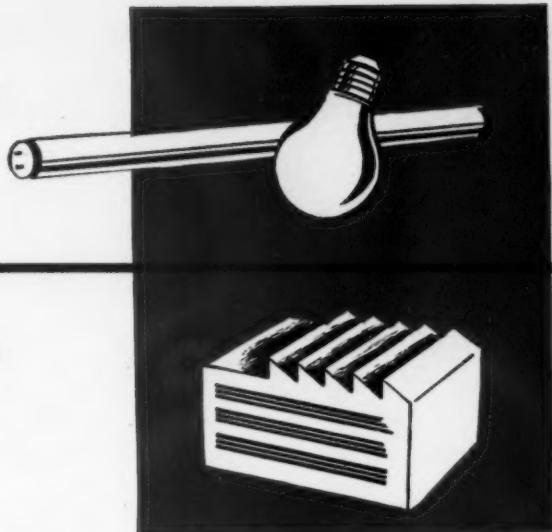
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Hydraulic
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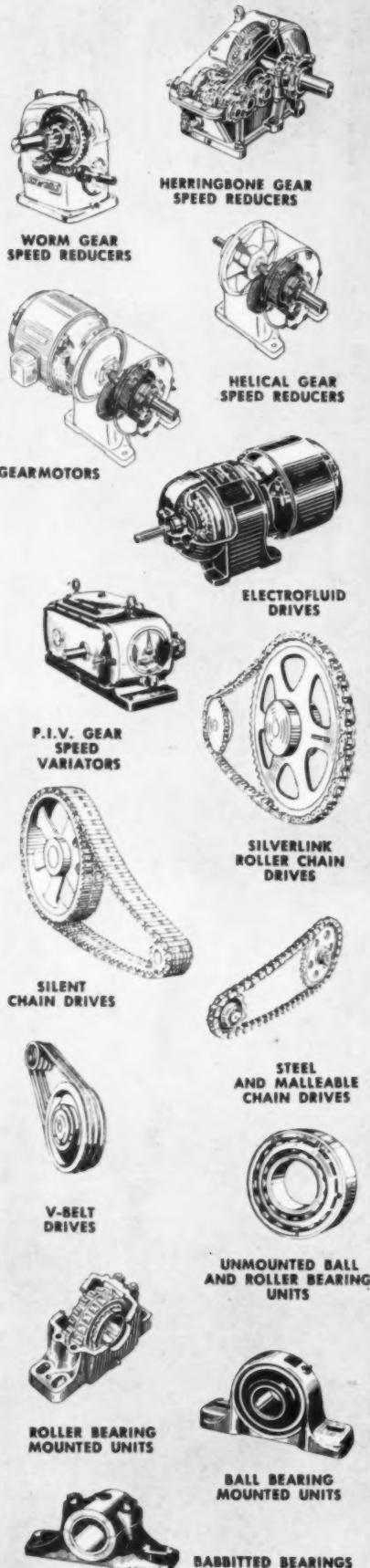
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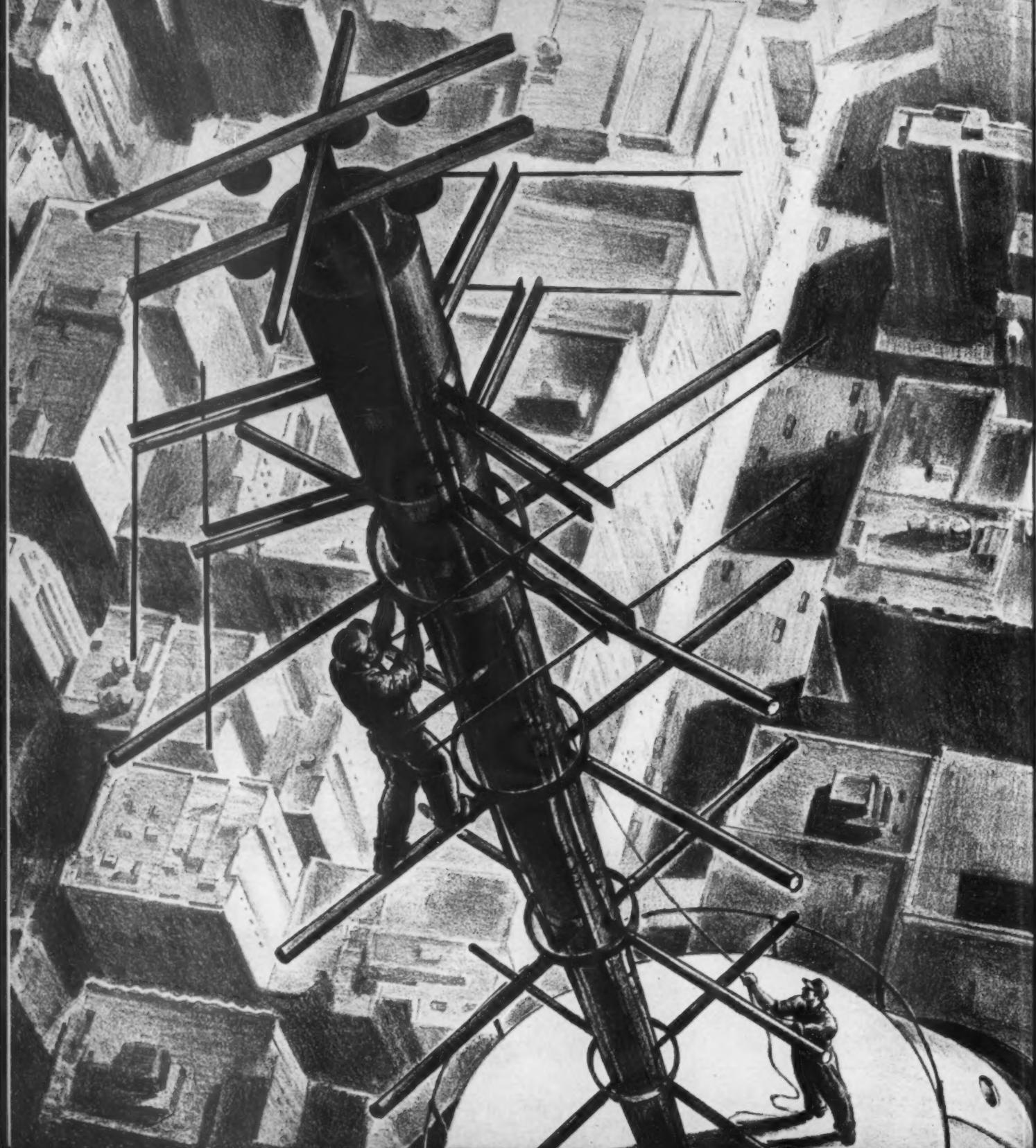
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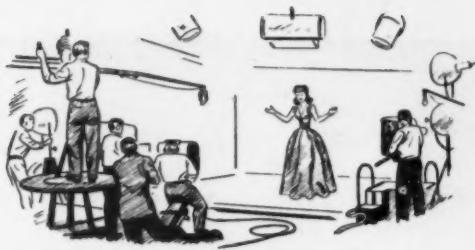
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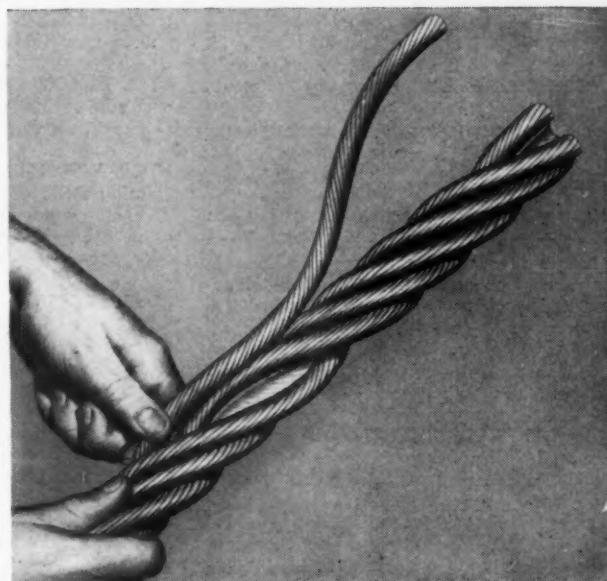
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2. **FILES**—"File Filosophy" is the name of booklet available from the Nicholson File Company on the kinds, care and use of files. Purchasing Agents and production men will find it a helpful booklet.

3. **FORMICA**—"Data on Formica". 32 pages of information and engineering data on "How, Where, Why to Use Formica", laminated plastic sheet that is utilized by industry for tubing, insulators, truck wheels, bobbins, etc., etc. has been issued by the Formica Co.

4. **SYNTHANE LAMINATED Plastics**—Booklet covers the complete line of Synthane laminated plastics which are available in sheets, rods, tubes, fabricated parts, molded-laminated, molded macerated. Synthane is moisture and corrosion resistant, hard, dense, easy to machine and has good electrical insulating properties. Synthane Corporation.

5. **ABRASIVE WHEELS**—Literature describes the Bay State line of abrasive wheels. Fractional grades split every single normal grade into three degrees of hardness, making for more precise selection for grinding needs. Bay State Abrasive Products Co.

6. **FASTENINGS**—Samples of Shakeproof Sems lock washers, "Speed Nuts", molding clips, threadcutting screws, etc., with literature explaining their merits and time and money saving qualities, are available from Shakeproof, Inc.

7. **SHOVELS, SPADES, SCOOPS**—New catalog J illustrates and describes the Wood Shovel & Tool Company's large line of quality shovels, spades and scoops. Blade steels include special analysis manganese

alloy steel, and special analysis high carbon steels. Blades are featured by hardness, strength, toughness, uniformity and lightness. Catalog also includes spoons, repair handles and D Tops.

8. **INDUSTRIAL FENCING**—"Planned Protection" is a complete manual on modern protection and control of property, issued by the Continental Steel Corp. It tells about the Continental Chain line which is made of rust-resistant Knok metal and 14 different construction features.

9. **PILLOW BLOCKS**—Catalog 280, second edition, covers the SKF family of pillow blocks in detail. SKF Industries Inc.

10. **WELDING EQUIPMENT & Supplies**—Catalog ADC 640-A covers Air Reduction's line of oxyacetylene apparatus and supplies, arc welding machines, electrodes and accessories, gases, carbide, etc.

11. **PLASTICS**—New literature tells about Bakelite and Vinylite Plastics materials, namely Phenolic molding materials, styrene molding materials, vinylite molding and extrusion plastics, vinylite resins for coating, bakelite resins for coating, vinylite plastics for upholstery, resin glues, bonding materials, laminating plastics, Vinylite plastic rigid sheet, plastic sheeting and flooring, plastics for wire and cable. This printed material will help bring you up-to-date on plastics. Bakelite Corporation.

12. **LOCO. CRANES**—Catalog 600-L4 shows how the Dielectric locomotive crane cuts costs 25 to 50%. This is new type crane new from trucks to boom point. American Hoist & Derrick Co.

13. **MATERIALS HANDLING**—Materials handling costs are now placed at 35% of production costs. "Handling Materials" is the title of booklet issued by Towmotor Corp., which points out how modern material handling methods can save time, money and manpower.

14. **RETAINING RINGS**—Booklet "New Development in Retaining Rings" tells how the Truarc rings slash assembly time, cut costs and provide never failing grip. Waldes Kohinoor Inc.

15. **END MILLS**—Eight additional types of end mills are included in the new Brown & Sharpe Manufacturing Company's catalog. They are made in a new range of sizes to meet practically all work requirements.

16. **AIR COMPRESSORS**—Air Hoists, Air Cylinders and Air Compressors are the subject of Catalog C-7 available from the Curtis Pneumatic Machinery Divn. of Curtis Manufacturing Co. Compressors are featured by Timken bearings, positive lubrication, carbon-free disc valves and automatic pressure unloader.

17. **DECALS**—Decal Guide and samples of decals for packaging, unusual surfaces, outdoor use, and products, is available from Palm, Fechteler & Co.

18. **FLUORESCENT LIGHTING**—Bulletin gives full information about the Trumbull Flex-A-Power (Type LVD—low voltage drop) which makes for lower electrical distribution costs. Trumbull Electric Manufacturing Co.

19. **ROPE KNOTS, HITCHES**—Chart illustrates and describes 14 knots and hitches which are said to be "probably the most important for industrial workers to use." Chart also shows rope sizes and strength. How many copies can you use? Plymouth Cordage Co.

20. **BEARINGS**—Catalog gives complete technical data on Tru-Rol Bearings termed the new bearing with "guide-lips" which are said to provide longer lasting, better and more economical performance. Rollway Bearing Co., Inc.

21. **CAP SCREWS**—Samples of both Size-Mark and Gear Grip socket head cap screws will be sent to you by Parker-Kalon. The correct size is cut on the head of the screw, eliminating need for "mike" or gauge, and hazard of error.

22. **BUSHINGS**—Bulletin 145 gives complete information and list of standard stock sizes of Shenango-Penn Mold Company's centrifugally cast bushing stock, and bar stock.

23. **SPEED REDUCERS**—Catalog covers motorized speed reducers, compact space-saving units which are manufactured to drive up, down, horizontally or at an angle. D. O. James Gear Manufacturing Co.

24. **PACKINGS**—The Belmont Packing Catalog is characterized as being a time-saver, and a packing reference book of 84 pages. It includes recommendation chart. Packing end views are pictured in large size showing minute details. Applications, weight and measures are laid out in easily readable form. The Belmont Packing & Rubber Co.

25. **METAL STITCHER**—Printed matter describes the Acme-Morrison Metal Stitcher, which fastens metal to metal, or non-metallic materials to metal. No prepunching is required. The machine forms its own stitch (or staple) from a coil of wire, drives, and clinches it. Acme Steel Co.

(Please turn to page 16)

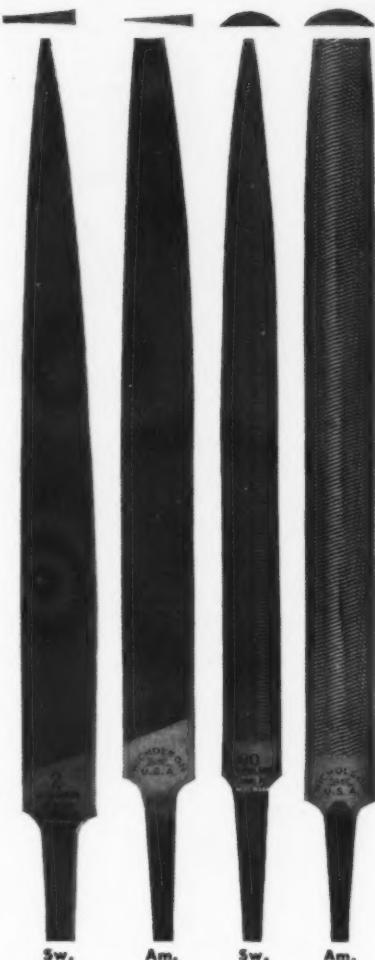
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on special-purpose files. Save it for
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Prepared by Nicholson File Co.



Typical comparisons of Swiss and American Pattern Files—Knife and Half Round shapes



Die making with Swiss Pattern Files

DIFFERENCE BETWEEN SWISS PATTERN AND AMERICAN PATTERN FILES

Nicholson X.F. Swiss Pattern Files are manufactured in accordance with the original Swiss designs or patterns and differ in a number of respects from American Pattern Files. Swiss Pattern Files were first made for jewelers, watchmakers and fine toolmakers. Today they are used wherever superfine precision filing is required.

Although the cross-sections of some Swiss Pattern and American Pattern Files are similar, many of the shapes are different. Other important differences are: (a) Swiss Pattern Files are made to more exacting measurements. (b) Their points are smaller and the tapered shapes have a longer taper. (c) They come in *seven* degrees of coarseness, against the three usually supplied in American Pattern.

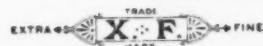
USES. Swiss Pattern Files are used extensively in automotive and aircraft factories; in die-casting plants; by makers of delicate instruments and optical goods; by workers on precious metals; for finishing and dressing dies of all kinds; for wood and ivory carving; and for model making.

These files are primarily finishing files and in general are used for removing burs left from previous machinery operations, rounding out slots, smoothing up small parts, and final finishing on all sorts of delicate and intricate pieces.

SPECIAL GROUPS. The Nicholson X.F. Swiss Pattern line includes such special-purpose groups of files as: Die Sinkers Files; Round and Square Handle Needle Files; Filing Machine Files in various shapes, sizes and types; Silversmiths and Die Sinkers Riffles. Individual types include: Crochet, Barrette, Slitting, Crossing, Pippin, Joint, Screw Head, Warding, Equaling, Pillar (in three standard widths).

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NICHOLSON FILES FOR EVERY PURPOSE

(Continued from page 14)

□ 26. GEAR SPECIALTIES—G-S small gears are the subject of catalog-bulletin issued by Gear Specialties, whose production includes spurs, spirals, helicals, bevels, internals, worm gearing, racks, etc. You will find this publication of especial interest if you are buying fractional horsepower gears.

□ 27. CUTTING TOOLS—Catalog describes the Clark Equipment Company's line of Celfor high speed cutting tools. Tools for almost every conceivable type of tooling problem are illustrated and described. Celfor Tool Divn.

□ 28. INDUSTRIAL FENCING—Anchor Protective Fencing is the subject of industrial fence catalog available from Anchor Post Fence Div., Anchor Post Products.

□ 29. WIRE MESH—Printed matter describes the C. O. Jelliff Manufacturing Corporation's wire mesh products. Commercial sizes available in standard lengths of 100 ft. and widths of 24 to 72 inches.

□ 30. TRACING CLOTH—Sample book of five different kinds of tracing cloth, marketed under two brand names—Micro-Weave and Pel-X, for ink tracing, white ink tracing, blue pencil tracing, white pencil tracing, and water repellent white pencil tracing, is being distributed by The Holliston Mills, Inc.

□ 31. SWEEP BRUSHES—Printed matter gives detailed information on sizes, styles and prices of Speed Sweep Brushes. The brushes are made with a steel back. Milwaukee Dustless Brush Co.

□ 32. WHEELS & CASTERS—Wheel & Caster Purchasing Guide is available from the Saginaw Products Corp. It gives details regarding costs, records, materials, and applications.

□ 33. MOTORS—New 8-page price list giving prices, weights, dimensions of all the most commonly used motors up to 75 hp has been issued by Crocker Wheeler Electric Manufacturing Co.

□ 34. MATERIALS HANDLING—Folder describes the "Mighty Midget" fork truck and describes how it sets a "new pace for cost-saving in factory or warehouse". Mobilift has no gears to shift. Mobilift Corp.

□ 35. CLEANING COMPOUND—Free sample of Elektro-Puri-It, which readily dissolves in water, and is termed an all-purpose cleaning compound will be sent to you by Trojan Products Dept., The Diversey Corp.

□ 36. MOTOR STARTERS—Booklet GEA-3571-A covers the General Electric Company's combination motor starters. Starters protect motors three ways by providing short-circuit, overload and undervoltage protection. Apparatus Dept.

□ 37. FLUORESCENT BALLASTS—Bulletin GEA-4950 describes G-E fluorescent ballasts which are lamp matched—engineered, manufactured, and tested to assure full rated lamp light. Apparatus Department, General Electric Co.

□ 38. FRACTIONAL HP MOTORS—Two bulletins available from General Electric Co. are No. GES-3565 which tells how the new NEMA standards affect motor selection problems, what they are and how applied, and No. GEA-4710 which describes the G-E coal stoker motor. Apparatus Department.

□ 39. BALL BEARING UNITS—SealMaster Catalog 845 describes line of ball bearing units made by the Bearing Division of Stephens-Adamson.

□ 40. FLOOR MACHINES—The American Floor Surfacing Machine Co. has issued series of catalogs on Saws, Floor Sanders, Edgers, Small Sanders and Maintenance Machines. Machines are built to save time and labor on the job and cut costs.

□ 41. NICKEL SILVER—The Seymour Manufacturing Company has issued new catalog which gives detailed information about merits and uses of Seymour nickel silver.

□ 42. PURCHASING—Reprint of article "Director of Purchases—A New Partner for Top Management", by Clifton Mack, will be sent to you by Standard Register Company. All members of purchasing departments will find this article worth studying.

□ 43. NAME PLATES—"Design for Name Plates" which shows over 4500 shapes and sizes of name plates, and how to save on name plates, is available from the Etching Company of America. Your engineering department will also find this book of value.

□ 44. BOND PAPER—Samples of "Correct" bond paper, an air-dried, rag content bond, which is available in eight brilliant colors with envelopes to match, will be sent to you by the Aetna Paper Company Divn., Howard Paper Mills, Inc.

□ 45. OFFICE SUPPLIES—44-page illustrated catalog describes procurement plan for office supplies designed to fit the needs of every purchasing agent, from the largest to the smallest firm. Thos. J. Moran's Sons.

□ 46. ENVELOPES—One-piece window envelopes and the savings to be made by their use are the subject of booklet "Right this Way" issued by Transo Envelope Co.

□ 47. FILING—Pendaflex folders, the hanging file folders, are the subject of catalog which explains how they cut filing time and help to eliminate misfiling. Oxford Filing Supply Co.

□ 48. DESIGNING BUSINESS FORMS—"How to Design a Business Form", and Form Designing Kit, together with sample books of Hammermill Bond and Cocklestone Bond, are available from the Hammermill Paper Co.

□ 49. AUTOMATIC TACKERS—Circular describes the new Hotchkiss automatic tacker, for stapling shipping tags to boxes, etc., fastening notices on bulletin board, and other uses. It uses six sizes of staples. The E. H. Hotchkiss Co.

□ 50. HEAT EXCHANGERS—Bulletin 96-P describes Niagara Aero Heat Exchangers for process equipment, controlled atmosphere processes, hydraulic equipment, etc. Niagara Blower Co.

□ 51. GAGES, DIAL INDICATORS—Bulletin 44 gives detailed description of Federal dial indicator gages which are a means for cutting seconds and rejects to a minimum. Federal Products Corp.

□ 52. SPROCKETS—Catalog gives complete information about the Cullman Wheel Company's sprockets and chains, illustrations and technical data.

□ 53. STAINLESS STEEL TUBES—"Bursting Pressure Bulletin No. 112A" provides practical technical data on Globe Stainless Steel Tubes. Globe Steel Tubes Co.

□ 54. VACUUM CLEANER—Literature describes commercial vacuum cleaner, which is available in two types—(1) combination wet and dry pickup, and (2) dry pickup. A&M Department, G-E Co.

□ 55. BUILDING—Corrugated Careystone is the subject of manual 808 published by the Philip Carey Manufacturing Co. It is recommended for walls, roofs, partitions; it can be sawn, nailed or bolted. Careystone is durable, strong, inorganic, fire-resistant, and easy to handle.

□ 56. OIL SEALS—Clipper seals, split and endless types, available for shafts up to 66" in diameter, which are recommended for sealing against oil, grease, water, air, grit and coolants at operating temperatures up to 450 deg. F. are the subject of brochure PK-31A issued by Johns-Manville.

□ 57. STAMPINGS, SPRINGS, ASSEMBLIES—The Hunter Spring Co. will send you copy of "The Statistical Method for Quality Control", including an explanation of the Hunter Quality Report Service.

□ 58. WIRE ROPE—"Know Your Ropes" is title of 82-page guide for rope buyers on the selection, application and use of wire rope. Wire Rope Sales Office, Wickwire Spencer Steel.

□ 59. INDUSTRIAL GLOVES—Illustrated catalog covering safety work gloves, finger protectors and safety apparel has been issued by Olympic Glove Co., Inc.

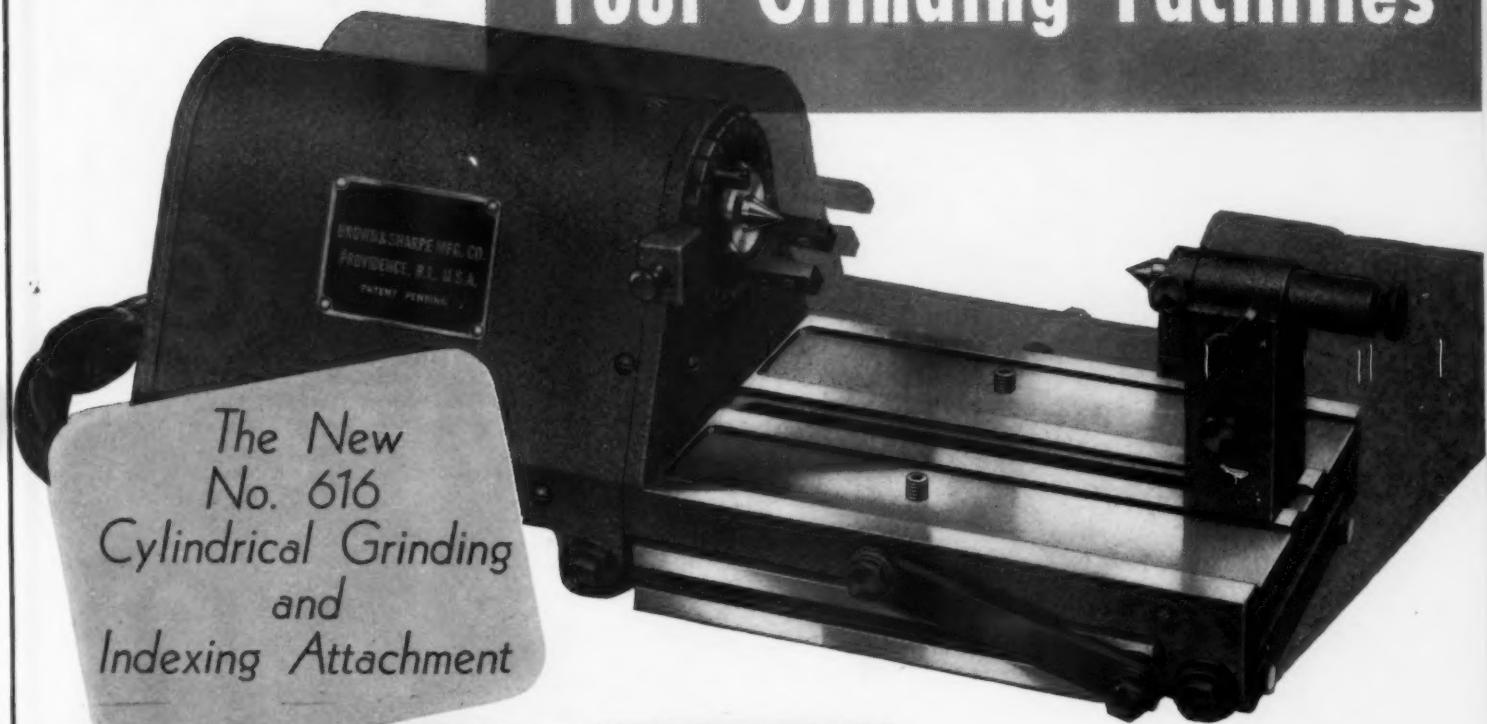
(Please turn to page 19)

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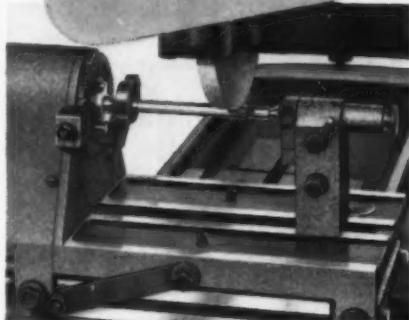
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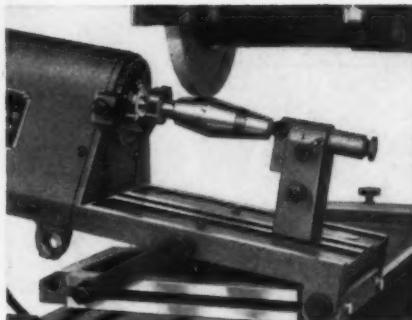
HERE'S A SIMPLE WAY to enlarge Your Grinding Facilities



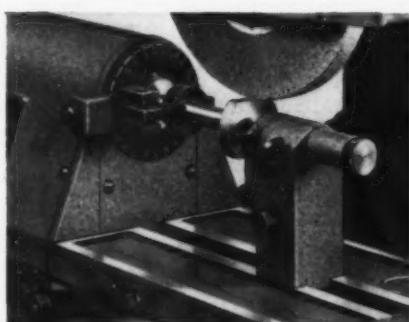
The New
No. 616
Cylindrical Grinding
and
Indexing Attachment



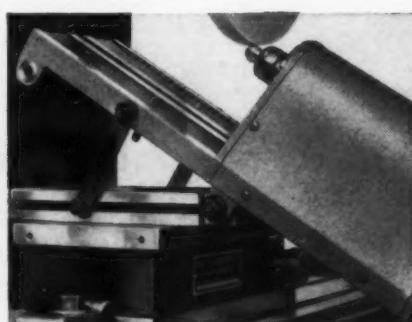
• Grinding work held between centers. Tailstock center is withdrawn for work change by simple swing of lever.



• Grinding taper shank. Attachment is readily adjustable to the desired taper.



• Grinding parallel flats using index plate. Index plate has 24 slots — is locked or released by plunger.



• Angular grinding of work held in spring collet. Attachment is held on permanent magnet chuck.

... for Surface Grinders

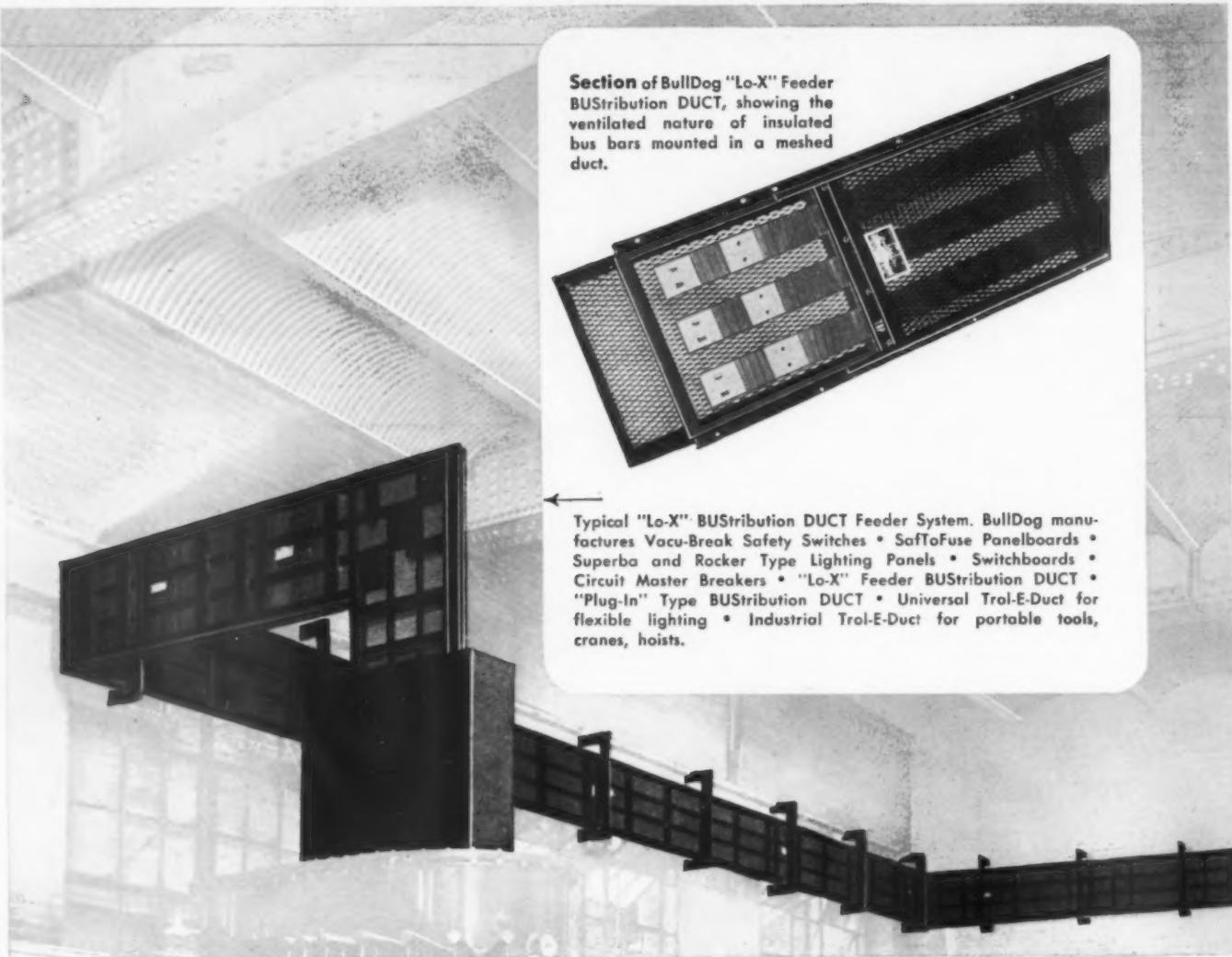
This new Brown & Sharpe Cylindrical Grinding and Indexing Attachment is designed to be used on surface grinders for dry grinding small cylindrical work, tapers and work requiring indexing. It is a simple way to enlarge your grinding facilities and may make unnecessary an investment in extra equipment.

Straight cylindrical or tapered work is ground between centers or, if $1/2$ " diameter or less, can be held in indexing spring chuck. Indexing is performed with headstock index plate or with interchangeable indexing spring chuck.

Centers swing 6" diameter; take work $5\frac{1}{4}$ " in length. Maximum grinding angle, 45° . 1/60 H.P., 115V., A.C. motor is completely enclosed. Write for illustrated folder. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

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BRING electricity into line the modern, efficient way with BullDog "Lo-X" BUStribution DUCT.

The ventilated casing and bus bar arrangement of "Lo-X" BUStribution DUCT make it carry electricity more efficiently. Ventilation beats conductor heating by dissipating heat into the air. Closely spaced paired-phase bus bars hold voltage drop to a minimum by reducing reactance. Resulting full power and low temperature rise assure peak efficiency of electrical equipment.

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BullDog's Field Engineers welcome the chance to sit in on the planning stages of a building project. Their knowledge of electrical distribution layout can mean savings in installation and maintenance costs, as well as highest efficiency and reliability in actual operation. Why not take advantage of this pre-build-ing service?

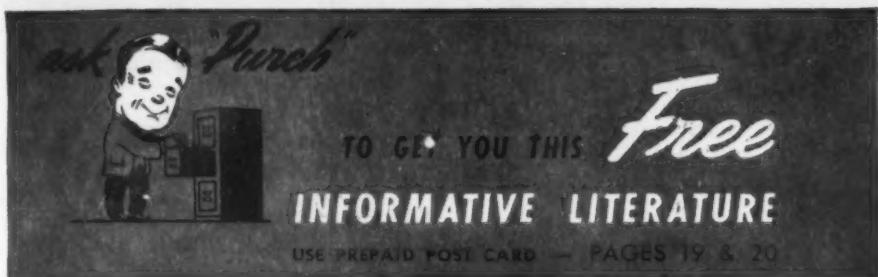
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HEADQUARTERS FOR ELECTRICAL DISTRIBUTION

PURCHASING



(Continued from page 16)

60. QD SHEAVES—New bulletin on Worthington Multi V-Drives has been issued by merchandising division of Worthington Pump & Machinery Corp. QD sheaves are available in A, B, C and D sections, fph to 200 hp. Goodyear EC Cord or Steel Cable V-Belts are used in drives.

61. INDUCTION-DIELECTRIC HEATING—Booklet B-3620-A gives 14 case histories of time and money saving jobs, large savings in assembly costs, cutting rejects and stepping up production, through the utilization of radio frequency heating. Westinghouse Electric Corp.

62. HEADS—Standard and ASME Flanged and Dished Heads are the subject of Catalog No. 1 which describes 3,868 Lukens heads. Heads are made of carbon and alloy steels, including stainless, non-ferrous metals and wide selection of clad steels. Lukens Steel Co.

63. SANITARY MOTOR—Bulletin No. 711 describes new splashproof, sanitary motors designed and built for dependable operation where sanitation is an essential. The Louis Allis Co.

64. GATE VALVES—Bronze gate valves are the subject of Circular No. 574. There are three specific types—double wedge disc, solid wedge disc, and single wedge disc. They meet all requirements for service where 150 lb. S.P. bronze gate valves are used. The Lunkenheimer Co.

65. ELECTRONIC TUBES—“Easy Guide for Electronic Tube Ordering”, Catalog 86-020 has been issued by Westinghouse Electric Corp. It simplifies replacement of electronic tubes for all types of electronic apparatus.

66. MASONRY DRILLS—Kennadrills (cemented carbide) which are said to “last 100 times longer in masonry, cement, brick, tiles, slate, asbestos, marble, porcelain,” because the cutting blade is as hard as sapphire, are the subject of Bulletin KP. Kennametal Inc.

67. CENTERLESS GRINDING—“Cortland Grinding Wheels for Cylindrical and Centerless Grinding” is subject of new booklet issued by Cortland Grinding Wheels Corp.

68. ADHESIVES—“3M Adhesives in Industry” explaining the merits of these adhesives for wide variety of industrial and manufacturing uses, has been issued by Minnesota Mining & Mfg. Co., Adhesives & Coatings Divn.

69. STUDS—Lok-Thred Studs are the subject of booklet issued by the Laramon & Sessions Co.

70. FLEXIBLE SHAFTS—Bulletin 4501 gives basic facts and engineering data on flexible shafts. S. S. White Industrial Divn.

71. REAMERS—Catalog 48 describes the Wetmore Reamer Company’s special adjustable reamers and precision boring bars, plus a complete line of standard cutting tools. Industrial Mills, Inc.

72. AUTOMOTIVE REPLACEMENT PARTS—20-page booklet constitutes report of Automotive Replacement Parts and their 1948 prices. Automotive Research Publications.

73. VALVE REPLACEMENTS—Check number of valve you wish to replace as shown on OIC cross reference Chart, and you will find the number of the OIC value to replace it. Copy of the chart is free. Ohio Injector Co.

74. FABRICATED PARTS—Illustrated brochure gives detailed description of equipment of the Colgate Manufacturing Co. for the fabrication of modern metals, in a print-to-package service. If your product uses sheet aluminum, magnesium, stainless steel.

75. TUBE FITTINGS—Bulletin No. 349 describes forged Imperial tube fittings (forged bodies on elbows and tees; straight fittings made from brass rod), for connecting copper, aluminum and other thin-wall metal tubing. Imperial Brass Mfg. Co.

76. BEARINGS—Catalog “K” gives complete information on every type and size of Federal bearing. The Federal Bearings Co., Inc.

77. SKYHOOK—This unique material handling equipment is described in circular. It is for moving materials via overhead cableway. It combines the functions of aerial cableway, motor crane, power shovel, grader, stacker, conveyor, loader, etc. By the application of tires it moves to a job on its own power carrying men and working material, and rigs its own skyroad. It will handle skip, clam shell, bucket, electromagnet, hook, tongs, sling or choker. John A. Roebling’s Sons Co.

78. VALVES, FITTINGS—Eighty-page catalog 51-J covers in detail the Cooper line of corrosion resisting stainless steel valves, fittings and accessories. Tab indexing makes it easy for the PA to get information on prices, dimensions, weights, etc. The Cooper Alloy Foundry Co.

79. ELECTRICAL SWITCHES—Micro precision switches are the subject of catalog 81. They are for use in a-c circuits in industrial, commercial and domestic applications. Features are small size (11/16" x 27/32" x 1-5/16"); light weight—less than an ounce; small operating force, and high electrical capacity. Micro Switch.

80. UNIT HEATERS—Unit Heaters are the subject of Modine catalog. The line includes wide range of types, models and sizes—designed to meet practically every space heating requirement. There are three separate and distinct types of unit heaters for steam or hot water. They may be used individually or in combination. Catalog gives design and construction data, performance data, dimensions and weights and selection and installation information. Modine Manufacturing Co.

81. AIR CONDITIONING-REFRIGERATION—Book “New Industrial Dimensions” tells about G-E industrial refrigeration and air conditioning equipment. It describes 17 important applications with photos and diagrams of basic heat transfer methods. General Electric Co., Air Conditioning Dept.

82. INDUSTRIAL TRUCKS—“Industrial Logistics” is title of material handling booklet issued by the Elwell-Parker Company. It describes all types of material handling trucks—fork, low lift, high lift, cranes and tractors. The book explains what type trucks are best suited for various jobs. The Elwell-Parker Electric Co.

(Please turn to page 20)

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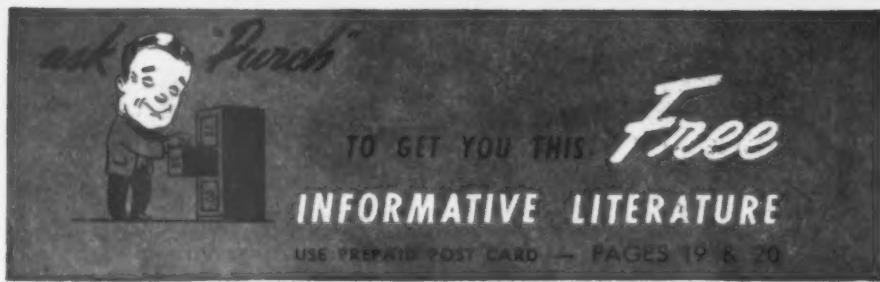
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9/48



(Continued from page 19)

83. **CASTERS**—Catalog K-38 covers the caster line of the Bond Foundry & Machine Co. These include free-rolling wheels, steel or rubber tread; double ball race casters, etc.

84. **WIRE CLOTH**—Catalog of 32 pages describes wire cloth for various uses made by the Reynolds Wire Co. It is available in weave, mesh or finish desired, of the metal or alloy in the temper, flexibility and diameter, desired.

85. **SHOP MULES**—“Photo Folio” illustrates all models of the Hebard “Shop Mule” tractors with working views. They are designed for low operation and maintenance costs on tough jobs. W. F. Hebard & Co.

86. **TOOLS**—New Tools Booklet illustrates mechanics’ hand measuring tools and precision instruments, dial indicators, steel tapes, hawksaws and band saws, and precision ground flat stock. The L. S. Starrett Co.

87. **STEEL STRAPPING**—The “Answer Book” tells about the Signode six-point steel strapping system for better shipping protection for cartons, crates, boxes, bags, bales, bundles, LCL, and carload lots. Signode Steel Strapping Co.

88. **V-BELTS**—Dayton V-Belts, from fractional to 1000 hp are the subject of booklet A-469 which will be sent to you with sample of the specially processed Rayon cord which features minimum stretch, greater flex strength, and long V-belt life. It is used in all Dayton V-Belt construction. Dayton Rubber Co.

89. **DIE-LESS DUPLICATING**—Catalog describes the O’Neil-Irwin benders, shears, brakes, etc., for making duplicate units with die accuracy without dies. O’Neil-Irwin Mfg. Co.

90. **HAND POWER TOOLS**—Catalog describes the Handee hand power tools for grinding, drilling, polishing, engraving, cleaning, sawing, carving and cutting met-

als, alloys, wood, plastics, stone, horn, bone, etc. Plug in any a-c or d-c socket. Catalog also includes over 500 grinding and mounted wheels, sanders, cutters, etc. Chicago Wheel & Mfg. Co.

91. **PLASTIC VIALS**—Samples of Clearsite plastic vials in rigid polystyrene and flexible polyethylene, which are odorless and not affected by alkalis, alcohols, etc., will be sent to you by the Celluplastic Corp. The flexible vials are of the squeezable type. Vials are 70 to 75% lighter than glass. The rigid type are shatterproof, transparent, translucent and opaque; and the flexible are available in all colors, translucent and opaque.

92. **THREAD DIES**—Acorn dies for threaded parts are explained in detail in the “Acorn Dies” booklet. Greenfield Tap & Die Corp.

93. **SPRINGS, FORMED WIRES**—Booklet “Springs and Formed Wires” is full of valuable engineering data and information on spring selection and performance. Spring Dept., Wickwire Spencer Steel Div., C. F. & I.

94. **METAL CONVEYOR BELTS**—Catalog describes Wissco metal Conveyor Belts. Wickwire Spencer Steel Div., of C. F. & I.

95. **INSULATING VARNISHES**—Application sheet describes “Tuffernell” insulating varnishes, which feature high resistance to heat, oil, moisture and chemicals. Westinghouse Electric Corp.

96. **A-C WELDERS**—Printed matter describes the new Westinghouse “65” Flexarc—a 65-volt industrial a-c welder with stabilized arc, which makes for faster, better and cheaper metal fabrication. Westinghouse Electric Corp.

97. **SAFETY SHOES**—Line of safety shoes in new and advanced designs are illustrated and described in detail in catalog No. 14, which is termed a “bible” for safety shoe buyers. It provides general and specific data for efficient, economical safety shoe buying. Lehigh Safety Shoe Co.

98. **FRICITION TAPES**—Sample 1/2 pound trial cans of Okonite and Manson tapes, enough to make a dozen or more splices in #6 wire will be sent to you by The Okonite Co.

99. **MATERIAL HANDLING**—Bulletin C-1, 56 pages, shows variety of applications of the Monorail System for efficient material handling. The American Monorail Co.

100. **JACKS**—Bulletin describes the Simplex line of industrial jacks, lever, screw and hydraulic. Templeton-Kenly & Co.

101. **ALLOY STEELS**—Carilloy Steels, Alloy Steels for the Special Jobs of Industry, is the title of 176-page book packed with practical information on the selection, heat treatment and application of alloy steels. Carnegie-Illinois Steel Corp.

102. **STAINLESS STEEL**—Fabrication, U. S. Stainless and Heat Resisting Steels, is title of “authoritative textbook” of various fabricating techniques recommended for the most successful handling of stainless steel. United States Steel.

103. **PREFABRICATED SHELVING**—Printed matter tells about the Hines prefabricated shelving units which are made of Ponderosa pine, and fastened with cadmium plated bracket and Masonite Tempered Preswood to serve as shelves and ends. Edward Hines Lumber Co.

104. **CARBIDE HAMMER BIT**—A carbide hammer bit for drilling granite known as the Blue Cyclone is the subject of bulletin issued by New England Carbide Tool Co. Tipped with carbide, the tool has two deep flutes and a tapered shank designed to fit the Rawl chuck. It is made in sizes 3/8", 7/16", 1/2", 5/8", 3/4" and 1".

105. **PACKAGING**—“Savings in Shipping” is title of case history booklet which tells about actual savings with Acme steel strapping, methods and tools for safe packaging. Acme Steel Co., Strapping Divn.

106. **INSPECTION DISCS**—Hardened inspection discs for tool and die makers, a new service announced by the Latrobe Electric Steel Company applying to Desegregated brand high speed steel and Desegregated high carbon-high chromium die steels. Discs are hardened, polished and etched units cut from bars in buyer’s mill order, and show the internal structure of the steel as it will be after normal processing and heat treatment in buyer’s plant.

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Special attention is given to the manufacture of wire of brass and silicon bronze for making screw products and special shapes by the cold upsetting process. Customers and prospects are encouraged to try out newer alloys with the object of improving their products through higher strength and greater resistance to corrosion and wear.

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FINISHING COMPOUNDS



"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company.

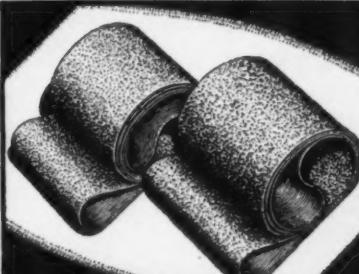
Cool-cutting GREEN GRIT wheels for cemented carbide.



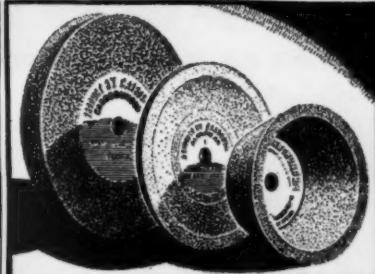
Specialized wheels by CARBORUNDUM for thread grinding.



Diamond wheels to meet stiffer technical needs.

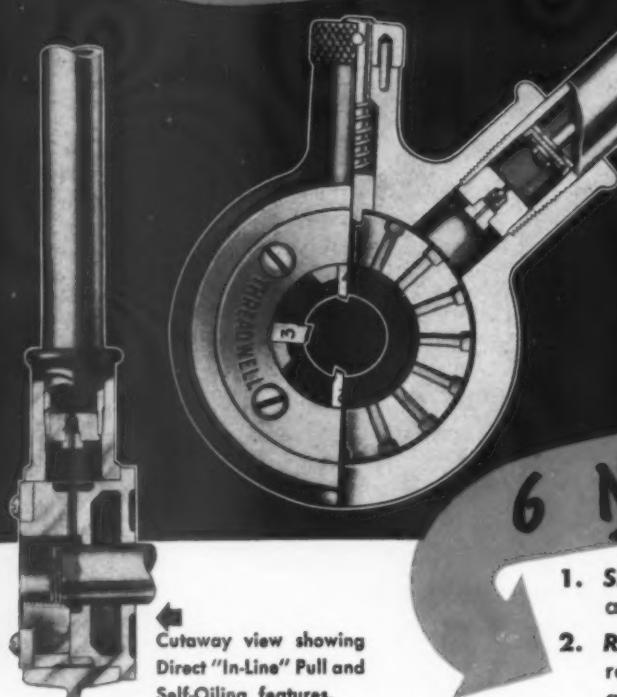


A coated abrasive for every sanding and finishing condition.



All standard shapes are supplied in grinding wheels by CARBORUNDUM

PRESS THIS BUTTON
and Solve Pipe Threading
Problems -



Cutaway view showing
Direct "In-Line" Pull and
Self-Oiling features.

with
THREADWELL'S
Self Oiling
PIPE THREADER

6 NEW Advantages

1. **SELF-OILING** . . . a squeeze of the button squirts oil on the pipe and dies regardless of the position the handle is in.
2. **REVERSIBLE RATCHET** . . . a twist of the pawl knob reverses ratchet direction instantly and allows easy removal of die head after threading.
3. **INTERCHANGEABLE DIE HEADS** . . . a pull of the ratchet pawl knob releases the die head in the stock and allows another to be inserted quickly and easily.
4. **DIRECT "IN-LINE" PULL** . . . direct alignment of handle over cutting dies reduces effort required to cut threads by 35%.
5. **INCREASED DIE LIFE** . . . tests show that the life of dies in a Threadwell Pipe Threader has been increased 150%, and dies can be resharpened when needed.
6. **EASE OF EFFORT** . . . the many features of the Threadwell Pipe Threader and their simplicity and ease of operation all add up to effortless pipe threading.

DELIVERY FROM STOCK



THREE STANDARD SETS

5A — Cuts 1/8", 1/4", 3/8", 1/2", 3/4", 1" & 1-1/4" threads.
5B — Cuts 1/8", 1/4", 3/8", 1/2", & 3/4" threads.
5C — Cuts 1/2", 3/4", 1", & 1-1/4" threads.

Plumbing Supply Jobbers are invited to write us on
their letterheads for price and delivery information.

Threadwell

"TOOLS OF DISTINCTION"

Threadwell Tap & Die Company, Greenfield, Mass., makers of Threadwell Taps, Dies, Counterbores, Twist Drills, Keyway Broaches and other fine cutting tools.

Tough...flexible...decorative...

maybe it can give you ideas!



THE material you see above is braided wire. Here at National-Standard it is produced in almost limitless variations... flat, tubular, plain, beamed, springlike or untempered, tight or expanded, in many wire sizes, in a great many widths, and of any metal that can be drawn into wire.

At present, the most common uses are for reinforcing pneumatic tire beads, high pressure hose and other rubber products. In these applications its strength and mechanical adhesion qualities are unsurpassed.

Considering its limitless variations and unique qualities, braided wire is bound to have many other effective applications. Perhaps it can save or make money for you! An interesting possibility, for example, is its use with transparent plastics to produce pleasing patterns as well as reinforcement.

If all this gives you an idea you'd like to explore, be assured that National-Standard, as usual, is ready to cooperate with you all the way. Let's talk it over. Just get in touch with the *National-Standard Company, Niles, Michigan*.



DIVISIONS OF NATIONAL-STANDARD CO.

ATHENIA STEEL..	Clifton, N. J.	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD..	Niles, Mich.	Tire Wire, Fabricated Braids and Tape
WAGNER LITHO MACHINERY..	Jersey City, N. J.	Lithographing and Special Machinery
WORCESTER WIRE WORKS..	Worcester, Mass.	Round Steel Wire, Small Sizes

WISSCO BELTS' *Open Mesh* CONSTRUCTION

Permits

FREE AIR CIRCULATION FOR

Annealing • Baking • Brazing • Cooling • Drying

FREE DRAINAGE FOR

Blanching • Degreasing • Frying • Quenching • Washing

EACH WISSCO BELT is custom-engineered for the job it is designed to perform—to operate efficiently at temperatures ranging from -40°F. to 2100°F., or to withstand corrosion, abrasion and other destructive factors.

Each Wissco Belt has in it the skill and experience that comes with 50 years of pioneering in belt development, design and application.

Learn how Wissco Belts can help you cut costs, insure faster production and more uniform quality. Send today for our illustrated catalog showing types and advantages of numerous conveyor belt constructions.



Typical of innumerable food processing operations Wissco chain-driven, stainless steel belts carry potato chips through washing, frying and draining operations with a minimum of manual attention.

WISSCO

METAL CONVEYOR BELTS

A PRODUCT OF WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

Belt Sales Office and Plant—56 Sterling St., Clinton, Mass.

Executive Office—500 Fifth Avenue, New York 18, N. Y.

Sales Offices—Boston, Buffalo, Chattanooga, Chicago, Denver, New York • Pacific Coast Subsidiary—The California Wire Cloth Corp., Oakland 6, Cal.

CFI

a blade like this



on a machine like this



boosted cutting speed

53%

There's good reason why a change to Atkins "Silver Steel" Powersaw Blades so frequently results in sensationaly improved cutting performance.

The Atkins "Curled-Chip" Tooth form, with its inward curved face, actually lifts the chip free in a smooth, continuous curling motion. Tooth-dulling heat and power-wasting friction are reduced to a minimum. In addition, these blades are made of Atkins own special analysis "Silver Steel"—the steel that was developed to take an edge and hold it through record cutting periods and consistently heavier feeds.

Why not ask your industrial distributor to arrange a demonstration on your own machines and work?

See your Industrial Distributor First

CUTTING REPORT
Material: 6" dia. No. 94100 Steel
(equivalent to Temkin No. 5200)
Cutting time with previous
blade: 13 min.
Cutting time with Atkins
blade: 8 1/2 min.
Increase in cutting speed 53%

ATKINS "Silver Steel" Hand Hacksaw Blades

The blade that takes the "hack" out of hacksawing. Fast-cutting, easy to work with. Made of "Silver Steel", with tough rugged teeth that hold up without breaking or dulling for many cuts through toughest metals. Ask for the blades with the "Blue Ends".



ATKINS

"Silver Steel" Saws

E. C. ATKINS AND COMPANY

Home Office and Factory
402 S. Illinois Street, Indianapolis 9, Indiana
Branch Factory: Portland, Oregon

Branch Offices:
Atlanta • Chicago • New Orleans • New York • San Francisco

MAKERS OF BETTER SAWs FOR EVERY CUTTING JOB



FAMOUS QUOTES

HISTORICALLY SPEAKING

**"GET THERE FUSTEST
WITH THE MOSTEST"***

GENERALLY SPEAKING

**"the container is part of
the product"**

... your products also "get there"—and in prime condition when shipped in General Engineered Shipping Containers.

Not only do General Boxes provide "all-round" protection but they are also compact and of lightweight construction. No weight or space is wasted . . . they are designed to the specific product, as "part of the product."

Our Designing and Testing Laboratories at Chicago and Brooklyn are staffed by packaging engineers of long experience. They will be glad to help you design a more economical and more efficient container for your product.

Write today for complete information . . . also for your free copy of "The General Box."

* Statement of Nathan Bedford Forrest (1821-1877), great Confederate cavalry leader. Volunteered as private in 1861; made a major-general in 1863.

GENERAL BOX COMPANY



GENERAL OFFICES:

42 W. Illinois St., Chicago 10, Ill.

DISTRICT OFFICES AND PLANTS: Brooklyn, Cincinnati, Detroit,

East St. Louis, Kansas City, Louisville, Milwaukee,

New Orleans, Sheboygan, Winchendon, Natchez.

Continental Box Company, Inc.: Houston, Dallas.

...engineered shipping containers



General
Nailed Box



General
Cleated
Corrugated
Container



General
Corrugated
Box



General
Wirebound
Crate



General
All-Bound Box



General
Lift
Pallet

ELECTRONIC HEATING

your newest, fastest production process

Let G-E same-day tube service
help to keep it 100% efficient!



"This is the pair—power tube plus rectifier—that makes quick work of your small heating jobs. When tube replacements are needed, don't tie up equipment by waiting... just phone your G-E tube distributor or dealer! New tubes will arrive in a jiffy."



GL-592 POWER TRIODE

Produces the h-f current for electronic heating. Max anode ratings are: voltage 3,500 v, current .25 amp, input 600 w, dissipation 200 w.



GL-866-A RECTIFIER TYPE

Changes a-c power to d-c for the h-f-heating tube. Anode ratings are: peak voltage 10,000 v, peak current 1 amp, average current .25 amp.

WHAT used to take minutes (even hours) now is done in seconds. That's electronic heating—latest weapon in your arsenal to keep output high, costs low.

So plan for full-time service from every unit of heating equipment! Tubes may need replacement on occasion. They're vital to operation. You can get them fast from your local G-E source of supply. Use this source freely as protection against costly heater shutdowns!

Management's eyes often blink when shown how wide is the use of small electronic-heater units: in dielectric-type work, for joining plastic parts; for hemming and "stitching" many waterproof fabrics; for sealing paper drinking

cups and containers—in induction heating, for surface-hardening small metal parts; for annealing; for brazing, quick-soldering, and setting glues by metal conduction.

To back up 'round-the-clock performance of equipment doing this work—or heavier work like bonding plywood, hardening gear-wheels, brazing major assemblies—G-E distributors from coast to coast stock power and rectifier tubes in all ratings. And every tube is solidly covered by General Electric warranty!

Remember, for replacements—your G-E distributor or dealer has the tubes you want! *Electronics Department, General Electric Company, Schenectady 5, New York.*

GENERAL ELECTRIC

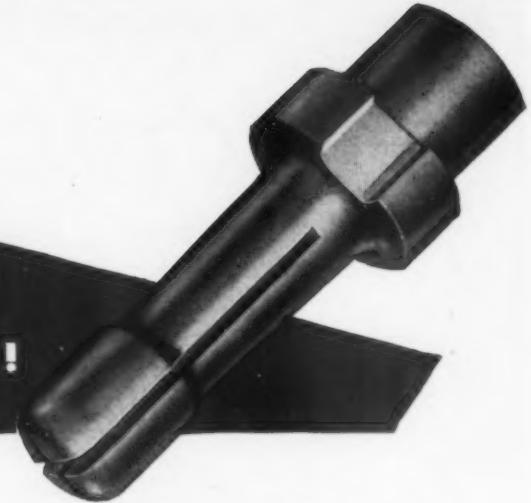


161-GA31-6850

FIRST AND GREATEST NAME IN ELECTRONICS



**the customer
SPECIFIED trouble!**



His order specified commercially produced phosphor bronze for the electric coupler plugs illustrated. Result: Non-uniform "spring-out" or collapse of segments caused loss of positive contact—and car-to-car circuit failure tied up an entire metropolitan transportation system!

Provided with the case history of these delinquent connectors, Riverside overcame the difficulty, without changing the alloy specifications, by developing a special process that eliminated the prime cause of the trouble . . . unequal stresses in the cold rolled stock. The process developed has been helpful many times since in furnishing exactly what is needed for extremely critical applications.

Riverside specializes in specialties.

By delicate adjustments and variations in formulations and processes, we add versatility to an alloy valued for its extreme toughness, high elasticity, resistance to corrosion, abrasion and fatigue. In Riverside Nickel Silver and Beryllium Copper as well, certain properties are accentuated to meet specific requirements.

So when you order Riverside *Phosphor Bronze*, *Nickel Silver* or *Beryllium Copper*, give us the case history of your product or problem. When we know the facts in full, our half-century of experience with non-ferrous alloys may enable us to suggest a change in alloying elements, a modification in grain structure, a variation in reduction, annealing or forming methods that will eliminate trouble and give you better, longer-lived products.

For more information about Riverside alloys, write today. Ask for copies of our three catalogs.

INSIDE RIVERSIDE

Everybody talks about 'Quality' but few seem able to define it. At Riverside, it's the direct result of choosing the finest materials—seeking continually for better ways of combining and using them—and treating every customer's problem as an individual challenge. This is why Riverside successfully satisfies the needs of so many different people for so many different kinds of alloys.

RIVERSIDE MAKES A FULL RANGE OF STANDARD (AND SOME SPECIAL) NICKEL SILVER AND PHOSPHOR BRONZE ALLOYS

THE RIVERSIDE METAL COMPANY
RIVERSIDE, NEW JERSEY

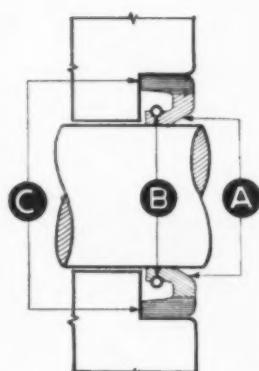
NEW YORK, CHICAGO, HARTFORD, CLEVELAND

RIVERSIDE

PHOSPHOR BRONZE
NICKEL SILVER
BERYLLIUM COPPER



EVER SEE AN OIL SEAL AS SIMPLE AS THIS ONE?



Here's how Clipper Seal works:

The flexible lip (A) is held in light but firm contact with the shaft by means of the garter spring (B). Pressure on shaft is carefully pre-determined to minimize wear, yet effectively seal against leakage. The rigid heel (C) provides a press fit in the cavity, assuring a tight lubricant-retaining seal at this point also. This design is readily varied to meet special conditions.



THE JOHNS-MANVILLE CLIPPER SEAL consists of only two parts—a one-piece moulded body and a specially designed garter spring, factory-assembled into a single compact unit.

This simple design, so different in principle, provides advantages not found in most conventional type oil seals. It permits unusual compactness and economy in designing oil seal cavities. It allows greater bore tolerances—since no metal case is used. It offers high corrosion-resistance—since Clipper Seal's body is entirely non-metallic. And it assures positive sealing with efficient, long-term bearing protection in a wide range of industrial oil seal applications.

Clipper Seals are made in both split and endless types and are available for shafts up to 66" in diameter. They are recommended for sealing against oil, grease, water, air, grit and coolants at operating temperatures up to 450° F.

For further information, write for brochure PK-31A. Address Johns-Manville, Box 290, New York 16, N. Y.

Johns - Manville

PACKINGS & GASKETS

FUSETRONS' Time-Lag STOPS Needless SHUT DOWNSHolds Harmless Overloads

As shown by this Example

"In 1941 our electrical superintendent and his assistant had test installations of Fusetrons made in many different sections of this plant.

"The spots chosen were those where needless blowing of fuses was causing trouble as on the drawing machines in the rod and nail mills, the 600 ampere main circuit feeding three 50 h.p. cranes, and motors in the open hearth department where ambient temperatures run very high.

"After months of operation, reports on all of these installations were so satisfactory that a complete standardization on Fusetrons for our entire plant was made.

"After over two years of standardization on Fusetrons a report from our general storekeeper showed that replacement cost on Fusetrons was about one-third of the former cost with renewable fuses.

"Naturally, the savings must be far greater due to elimination of production interruptions. Actually, we can probably credit Fusetrons to a large extent for the all-time records we have set since we installed them — because we have had the same plants and equipment that we had had in previous years."

A Large Steel Plant
(Name on Request)

What is the Fusetron?

The Fusetron is Bussmann's dual-element fuse — a fuse with tremendous time-lag and much less electrical resistance.

Fusetrons have the same degree of Underwriters' Laboratories approval for both motor-running and circuit protection as the most expensive devices made.

Made to the same dimensions as ordinary fuses, Fusetrons fit all standard fuse holders.

Obtainable in all sizes from 1/10 to 600 ampere, both 250 and 600 volt types. Also in plug types for 125 volt circuits.

Their cost is surprisingly low.



BUSS'

Keep Your Men and Machines on the Job!

With Fusetrons installed throughout your electrical system you will be entirely free of shutdowns caused by fuses blowing on motor-starting currents or other harmless overloads.

It is the time-lag of Fusetrons that does it. For instance: at 300% load a 30 amp. 250 volt Fusetron will hold 39 seconds before opening — yet the ordinary fuse with the longest time-lag will blow in $2\frac{1}{10}$ seconds. The Fusetron holds 15 times as long.

Other size Fusetrons in both 250 and 600 volt types show similar results . . . yet —

With all this time-lag there is no sacrifice of safety as is assured by the Underwriters' Laboratories inspected label carried by Fusetrons.

2.6
SECONDS
FUSE

39
SECONDS
FUSETRON

Why worry with Electrical Shutdowns? — do something about them.

The tremendous time-lag of Fusetrons wipes out needless shutdowns so completely that you are able to:

Start all the motors on a circuit at one time — and the Fusetrons won't open.

Have machines momentarily jam or be overloaded — and the Fusetrons won't open.

Throw a bank of welders across the line — and the Fusetrons won't open.

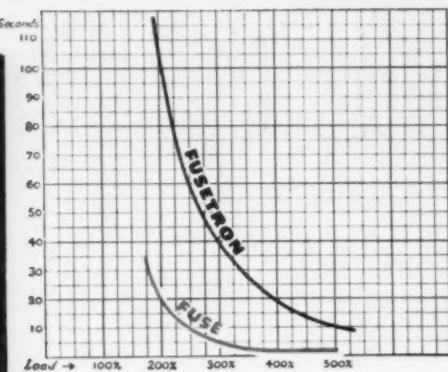
Load your circuits nearer to the capacity of your switches and panelboards — and not be penalized by recurring useless shutdowns.

If you want the nearest thing to complete freedom from needless interruptions of electrical service, without in any way sacrificing safety — install Fusetrons throughout your entire electrical system.

Get All the Facts—Find out how it will pay you to install Buss Fusetrons throughout your electrical system.

One needless shut down — or one lost motor — or one destroyed panel, may cost you far more than replacing every fuse with a FUSETRON.

Don't risk such losses — protect yourself by changing over your entire electrical system to FUSETRONS.



Ability of Fusetrons to hold starting currents or other harmless overloads is shown by above curve on 30 amp., 250 volt size. Other 250 volt sizes and 600 volt sizes show similar results.

Fusetrons GIVE MANY Kinds of Protection Heretofore NOT Available

- ★ Entirely wipe out needless blows caused by motor starting currents or other harmless overloads.
- ★ Give Thermal Protection to Panelboards and Switches.
- ★ Operate cooler because of lesser resistance, thus prevent needless blows caused by heating in panelboards and switches.
- ★ Permit use of larger motor or adding more motors on circuit WITHOUT installing larger switch or panel.
- ★ On new installations, PROPER size switches and panels can be used instead of OVERSIZE.
- ★ Protect small motors against burnout, simply and inexpensively.
- ★ Give DOUBLE protection to large motors.
- ★ Provide simplest way to stop burnouts from single phasing.
- ★ Protect coils, transformers and solenoids against burnout.

Send the Coupon Now!

Bussmann Mfg. Co., University at Jefferson
St. Louis 7, Mo. (Division McGraw Electric Co.)

Please send me complete facts about BUSS
Fusetrons.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ 948

FUSETRONS

Sold Through Wholesalers

If Your Product Uses

SHEET

ALUMINUM

MAGNESIUM, STAINLESS STEEL

CHECK COLGATE FACILITIES

for fabricating it

a Wealth of

INFORMATION

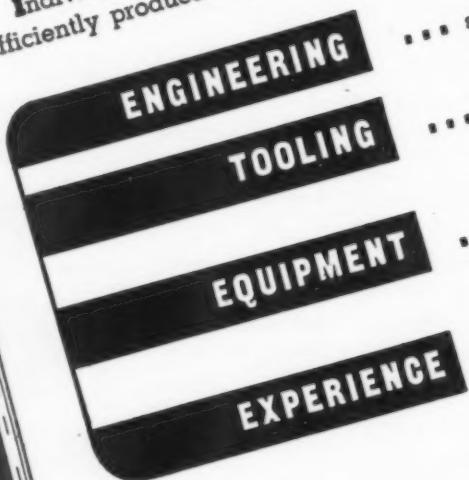
Twenty pages packed with facts on Colgate facilities and services can be of substantial help in selecting a fabricator. This illustrated brochure is yours for the asking.



Important advantages in fast deliveries, savings in freight and lowered manufacturing costs accrue when utilizing the integrated facilities of a specialist in fabricating the light metals. Geared to the needs of industries demanding the utmost in value, Colgate services can save time, trouble and expense in getting a new product into production or in expanding output of present products.

For manufacturers in the East, Colgate location—an hour from New York City—affords fast delivery, easy communication and reduced shipping costs. For those in the West, this location is ideal for a factory serving as an Eastern Branch Plant or as a supplier to exporters shipping from Middle Atlantic or New England ports.

Individual parts, major subassemblies or finished products are efficiently produced by these integrated Colgate facilities:



... skilled technicians to work with your engineers.

... experienced tool designers, master toolmakers, a modern tool and die shop.

... shears, brakes, presses, welding, finishing, assembly and packaging facilities.

... the intimate knowledge of working the light metals gleaned from long familiarity with these modern materials.

COLGATE Manufacturing Corporation

522 SOUTH BAYVIEW AVE.,

AMITYVILLE, LONG ISLAND, NEW YORK

FABRICATORS OF **LIGHT METALS**: ALUMINUM, MAGNESIUM, STAINLESS STEEL

OVEN TEST COOKS UP LONGER LASTING PRODUCTS



QUAKER PRE-TESTED PRODUCTS FOR INDUSTRY ARE PERFORMANCE-PROVED THROUGHOUT THE NATION

It may be called the "Oven Test," but to the buyer of Quaker Rubber Products it means producing rubber with the ability to withstand heavy static loads.

In making Quaker Rubber Hose it results in compounds of controlled specifications that will hold couplings over long periods of time . . . prevent hose from relaxing and allowing couplings to loosen. In packings, this pre-testing assures finished products that will hold their shape, will not relax, readily withstand pressures without the danger of blowouts.

This is only one of eighteen rigid tests that raw materials and finished products must pass before receiving the Quaker stamp of approval. Pre-testing provides quality and long service . . . assures worthwhile dividends for you through higher plant efficiency, lower operating costs. Call in your nearest Quaker distributor for hose, belting and packings.

QUAKER RUBBER CORPORATION

PHILADELPHIA 24, PA. • New York 7 • Cleveland 15 • Chicago 16 • Houston 1
Western Territory

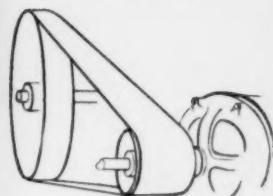
QUAKER PACIFIC RUBBER CO. • San Francisco 10 • Los Angeles 21 • Seattle 4



QUAKER RUBBER PRODUCTS

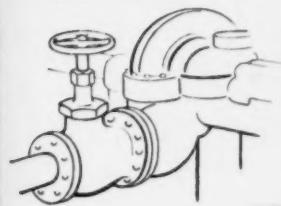
custom made for every industrial use

WHAT QUAKER Pre-Tested Products mean to Industry



STEADY GRIP . . . LESS SLIP

Quaker V-belts and flat belting are pre-tested to provide plenty of grip, plenty of pull for more power. Pre-tested rubber stays flexible, withstands aging and abrasion.



TIGHT-SEALING OPERATION

Quaker pre-tested packings for all purposes keep pressure in . . . stop leaks on valve stems, piston rods, flanges. Made of pre-tested materials for long life.



LONG SERVICE AT HIGH PRESSURE

Quaker hose provides low-cost handling of steam, air, liquids, volatiles. Pre-tested rubber remains pliable, flexes easily, combats breakdown.

ENGINEERING SERVICE

When belting, hose, and packing problems bog down efficiency in your plant, call your Quaker Distributor for a quick solution.

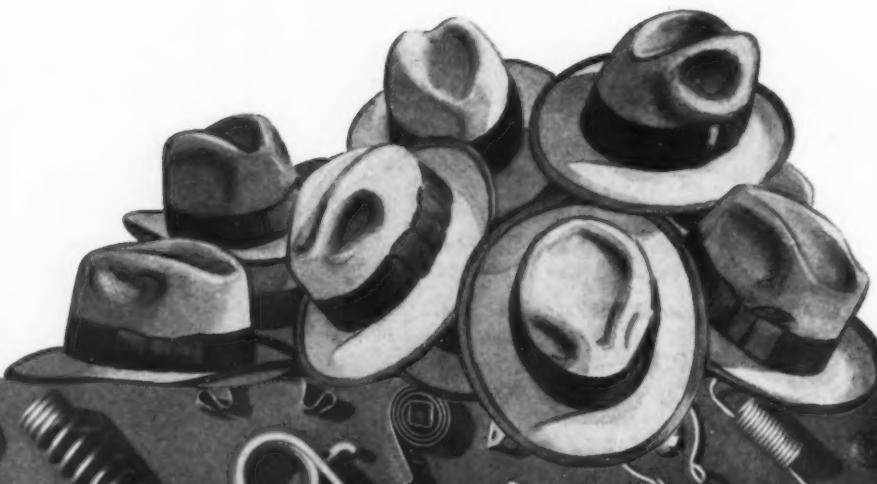
SEVEN HEADS ARE BETTER THAN ONE



.... especially when it's *your* spring those heads are concentrating on. Whether it's a matter of material, design, method of manufacture or deliveries, it's to your advantage to know that the best skills in the craft are instantly ready for group consultation and action.

Make these plants your partners in mechanical progress.

SPRINGS
SMALL STAMPINGS
WIRE FORMS



ORIGINAL DIVISIONS OF ASSOCIATED SPRING CORPORATION

WALLACE BARNES COMPANY
BRISTOL, CONNECTICUT

THE WILLIAM D.GIBSON COMPANY
1800 CLYBOURN AVE.
CHICAGO 14,

RAYMOND Manufacturing COMPANY
CORY, PENNSYLVANIA

BARNES - GIBSON - RAYMOND
6400 MILLER AVE., DETROIT 11,
and ANN ARBOR, MICH.

... AND DUNBAR BROTHERS COMPANY DIVISION, BRISTOL, CONN.
OHIO DIVISION, 1712 EAST FIRST STREET, DAYTON, OHIO
IN CANADA, THE WALLACE BARNES CO., LTD., HAMILTON, ONT.



These Bolts are too brittle



These Bolts are too soft



These Bolts are just right



Circle **B** Bolts and Nuts . . . both standard and special . . . are carefully inspected for size and strength. Their dependability is a definite asset to products on which they are used.

BUFFALO BOLT COMPANY

North Tonawanda, N.Y.

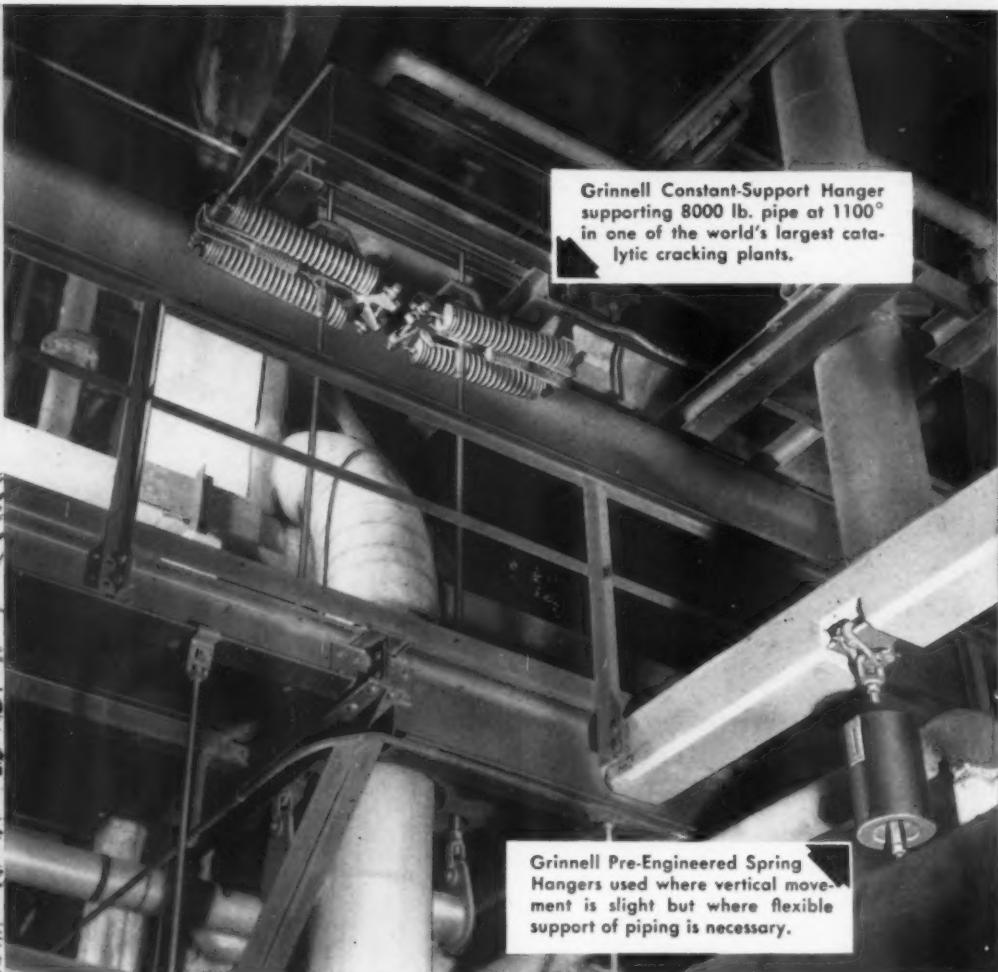
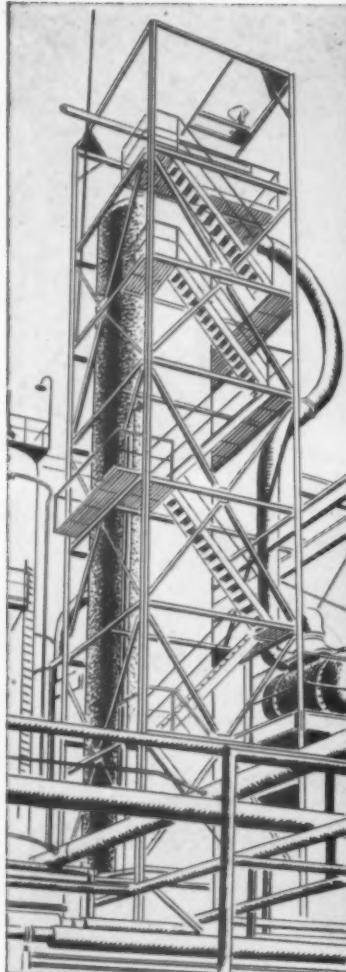
SALES OFFICES IN PRINCIPAL CITIES

Export Sales Office: Buffalo International Corp.,
50 Church Street, New York City

...they are CIRCLE



BOLTS



When an 8,000 lb. Pipe Starts to "GROW" ... it takes a lot of holding

When a piece of pipe gets hot, it "grows" . . . often rising inches above its position when cold. If this expansion should be crowded back into the piping system, it would cause destructive strains, lowering the safety factor of the entire system. The pipe must be allowed to rise.

A unique type of hanger to support the pipe is needed. As the pipe rises the hangers must maintain the same lift, because the pipe weighs just as much hot as it does cold.

That hanger is the Grinnell Constant-

Support Hanger, the only constant support hanger. Like a tireless arm of steel, it flexes as the pipe rises and settles, yet its lift never varies.

The solution to this complicated problem created by Thermal Movement is typical of Grinnell's complete piping service, which provides the products, the facilities and the experience to handle every piping requirement.

GRINNELL

GRINNELL COMPANY, INC.
Providence 1, R. I.



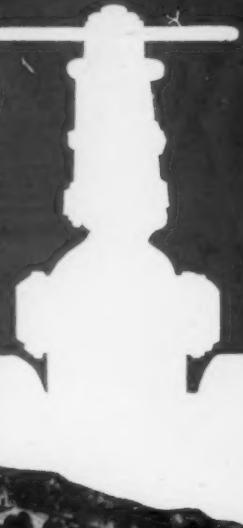
PIPING SUPPLIES

• Pipe, Valves and Fittings • Engineered Pipe Hangers • Grinnell-Saunders Diaphragm Valves • Thermolier Unit Heaters • Prefabricated Piping • Plumbing and Heating Specialties • Oil, Water Works and Industrial Piping Supplies.

OTHER GRINNELL PRODUCTS

Automatic Sprinklers and Special Hazard Fire Protection Systems.
AMCO Humidification and Cooling Systems.

WATCHDOG OVER INDUSTRY



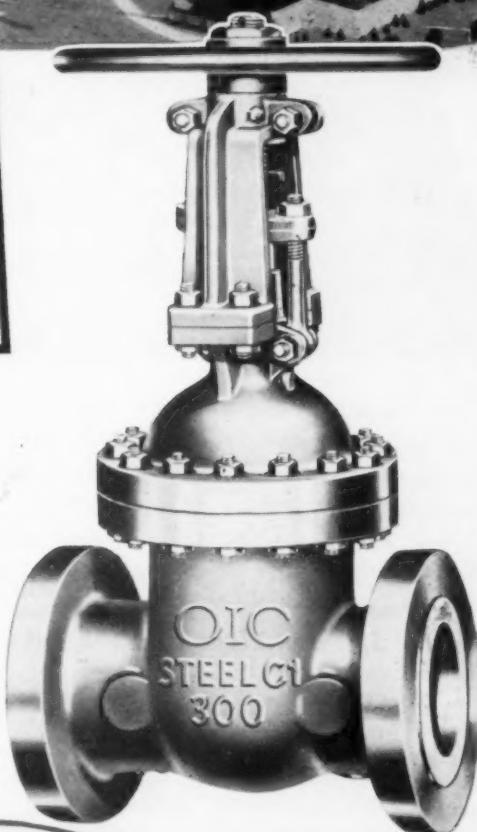
OIC
PACE-SETTER
IN VALVES

Everywhere OIC Valves are the trusted guards of industry's vast resources! By day and by night they constantly watch over millions of dollars in industrial materials. Leak-proof joints guard against disastrous pressure-drop. Streamlined designs protect flow from turbulence. Heavier construction throughout keeps pressures and stresses within safe bounds. Wedges of heavy I-beam design keep a close watch on the fluid passageway, stopping all flow with positive, leak-proof closure, or opening the streamlined ports for smooth, even, *free* flow! Integral body ribs guide the wedge to its seats with unerring accuracy—effectively reduce vibration and wear.

Your pipelines are *safer* when they're protected by OIC, Pace-Setter in Valves!

**VALVE INFORMATION THAT YOU NEED IS ALWAYS AT
YOUR FINGERTIPS IN THE BIG 248-PAGE CATALOG!**

Send for your free copy today. You'll save time with the valve data and specifications that you can use so quickly and easily. Simply write The Ohio Injector Company, Wadsworth, Ohio.

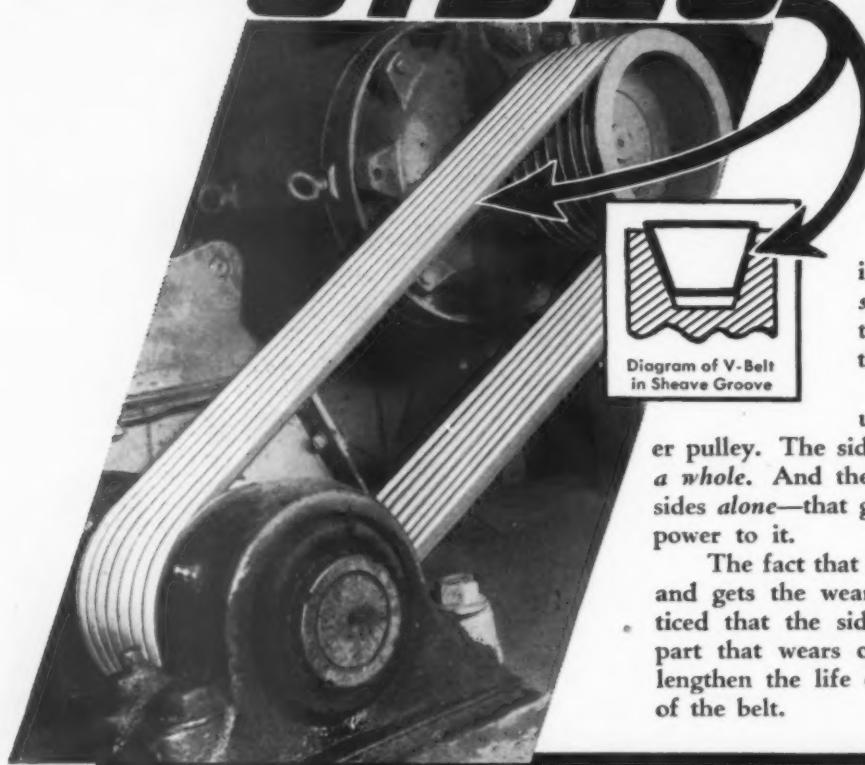


VALVES

STEEL • IRON • BRONZE

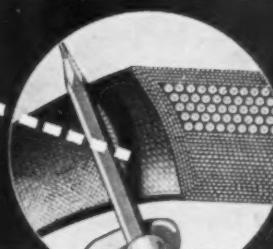
0-448-6

It's the **SIDES** of a V-BELT That Really Get the WEAR!



Now See How the **CONCAVE SIDE**
SAVES Sidewall Wear
and Lengthens Belt Life!

U. S. PATENT
NO. 1813698



The simple diagrams on the right show exactly why the ordinary, straight-sided V-Belt gets excessive wear along the *middle of the sides*. They show also why the Concave Side *greatly reduces* sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belts can possibly give.

Saving Sidewall Wear is MORE IMPORTANT NOW Than Ever Before!

Now that Gates **SPECIALIZED** Research has resulted in Super Vulco Ropes capable of carrying much heavier loads—fully 40% higher horsepower ratings—the sidewall of the belt is called upon to do even more work in transmitting these heavier loads to the pulley. Naturally, with heavier loading on the sidewall, the life-prolonging Concave Side is more important now than ever before!

THE GATES RUBBER COMPANY, DENVER, U. S. A.
"The World's Largest Makers of V-Belts"

489

GATES VULCO ROPE DRIVES
Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS

of the U. S. and
71 Foreign Countries

Fig. 1

Straight Sided V-Belt

Fig. 1-A

How Straight Sided V-Belt Bulges When Bending Around Its Pulley

You can actually feel the bulging of a Straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Fig. 2

Gates V-Belt with Concave Sidewall

Fig. 2-A

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt is Bending Over Pulley.

No bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

The Mark of **SPECIALIZED** Research.

FELT WICKS RELIABLE, CONTROLLED LUBRICATION

Four Basic Wick-Feed Lubrication Systems Meet Diverse Requirements
Design Is Simple, Cost Is Low, Reliability and Long Life Assured

Lubrication by means of felt wicks permits oil to be fed to bearings and other moving parts, automatically and without failure or interruption. Wicks permit extremely fine control of lubricant, from many drops to a small fraction of a drop per minute. Where actual consumption of oil is low, oil-impregnated felt makes possible the use of completely enclosed parts, such as sealed bearings, and is in fact essential to them. In such applications it can be expected that lubrication will be supplied throughout the life of the part, and that no attention will be required between major overhauls.

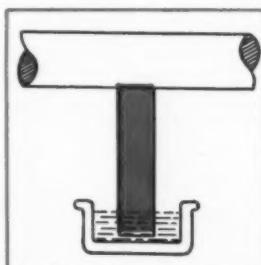
The cost of a felt wick is low, in fact infinitesimal compared with the cost of the machine or part whose performance it protects.

TYPES OF WICK OILERS

There are four types of wick lubrication systems. Choice of any given type depends upon such factors as the lubrication needs of the moving part, accessibility, available space, operating and servicing conditions, and similar matters of design and use.

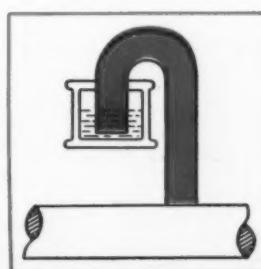
1. BOTTOM WICK OILER.

In this type, the felt wick is immersed in a reservoir of oil beneath the bearing, and through capillarity carries the oil upward to the point of lubrication. Maximum vertical wicking distance, about 6 inches. This is generally considered the most efficient system. Unused oil is returned to the reservoir, and no attention is required beyond occasional cleaning and replenishing of oil as required. An ideal system for apparatus such as motors, generators, and factory equipment.



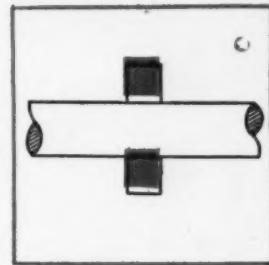
2. SYPHON WICK OILERS.

Felt wicks of this type are widely used, particularly where oil is to be delivered uniformly and at a controlled rate to a remote friction point. In addition to other methods of control, the flow of lubricant can be increased by increasing the vertical wicking distance from the reservoir to the point of lubrication, taking advantage of gravity.



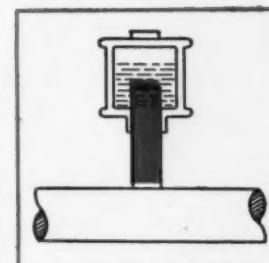
3. ABSORBENT OR PAD FEED OILER.

Here the lubricant is contained entirely within the felt, and is released automatically as required. This is the type often employed in sealed installations, though it may also be used in conjunction with a filler tube, the chief purpose of which is to act as a small reservoir. The oil absorption or storage capacity of felt is high. For example, SAE F-10 felt, recommended for pad oiling, will store oil of any viscosity to the extent of approximately 450 per cent of its own weight.



4. TOP FEED OILER.

The reservoir is above the lubrication point, and oil is supplied through a felt wick inserted in an outlet in the bottom. In this case, the wick acts as an obstruction to control the flow of oil. Frequently the wick is mechanically constricted to effect further control while taking advantage of storage capacity between constriction and delivery point. This insures uniform lubrication and provides a surplus reserve of oil in the event of an empty reservoir.



There are four types of SAE felts recommended for wick feed lubricating systems. Complete information is contained in American Felt Company Data Sheet No. 6, "Wicks and Lubrication." This eight-page Data Sheet presents complete technical data, including formulae, charts, graphs, tables and a listing of standard wick felts from which engineers can calculate wick performance and arrive at a design and specification that will meet the requirements of a given application. Write on your letterhead for your copy.

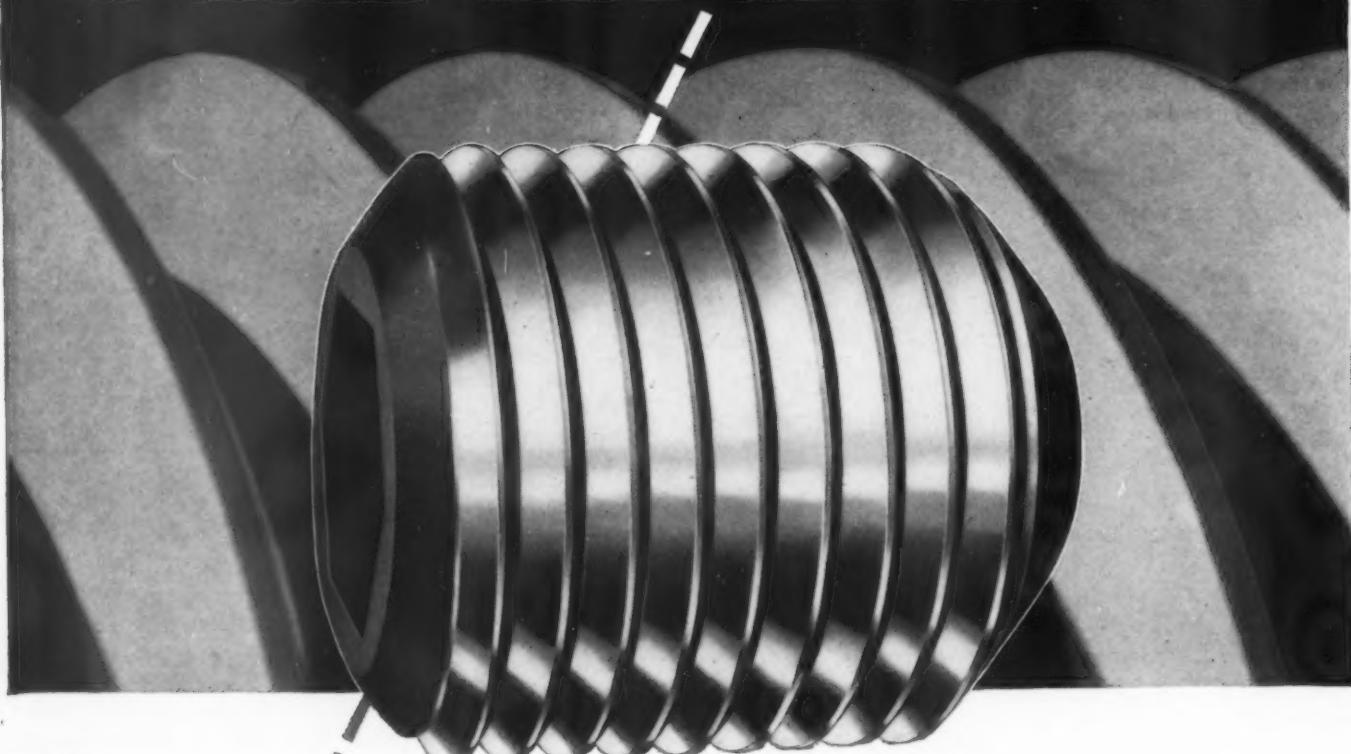
**American Felt
Company**
TRADE  MARK

Engineering and Research Laboratories: Glenville, Conn.
PLANTS: Glenville, Conn.; Franklin, Mass.; Newburgh, N. Y.; Detroit, Mich.; Westerly, R. I. SALES OFFICES: New York, Boston, Philadelphia, Atlanta, Rochester, Chicago, Detroit, Cleveland, St. Louis, Dallas, San Francisco, Los Angeles, Portland, Seattle, Montreal

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mirror smooth, they have none of the nicks, burrs and other imperfections common to cut threads.

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STRENGTH**
WITH
WILLIAMS
"Superrenches"



Awkward, hard-to-reach adjustments present no problem for these streamlined "Superrenches". Forged from alloy steel, they are light in weight yet their strength is equal to that of the strongest wrenches made. Available in all popular patterns, with openings from 3/16" to 3-1/8". "Superrenches", with highly polished heads, are handsomely finished in durable chrome plate, over nickel.



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by Changing to *Carpenter STAINLESS TUBING* . . .

Right at the start of your jobs, this Stainless Tubing gives you savings of 15% to 40%.

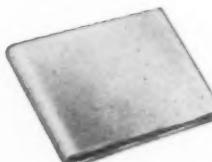
Now add the savings you can make with uniformly good fabricating results on each and every lot . . . fewer rejects and freedom from costly tooling troubles.

Reducing your unit costs on Stainless Tubing jobs is possible today. You can start by calling on Carpenter, just as they did on this valve seat job.



Valve seat inserts for high speed engines were once machined to $\pm .001"$ at a cost of 18¢. Now that 2" O.D. Type 304 Carpenter Stainless Tubing is used, each machined unit costs only 10¢.

IMPROVED PRODUCT PERFORMANCE and TROUBLE-FREE FABRICATION
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FLATTENING TEST protects you against the possibility of O.D. defects. Specimen is flattened between parallel plates until distance between plates is 3 times the tube's wall thickness. Any sign of cracking or flaws is cause for rejection.

TRANSVERSE BEND is used to double-check the I.D. structure of Carpenter Stainless Tubing. Sample is slit longitudinally and then bent as in the flattening test, but in the opposite direction.

These tests, made at several stages of manufacture, prove quality of the entire tube section and are made on every lot of full finished Carpenter Stainless Tubing before it is released for shipment.



USEFUL SLIDE CHART gives you information that has never before been available in such easy-to-use form. Data on Physical Properties, Velocity Constants, Mass Velocity Constants, etc. A note on your company letterhead will bring your Slide Chart to you.

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"MORE THAN CORROSION RESISTANCE"



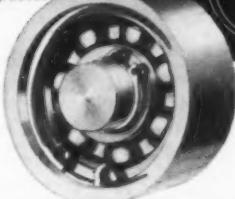
THE CARPENTER STEEL COMPANY

Alloy Tube Division, 122 Springfield Road, Union, N. J.

Send for new 28-page data book on Waldes Truarc Retaining Rings

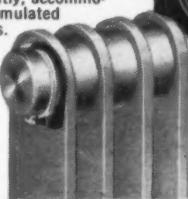
Standard*

Forms secure shoulder, gives tight pressure fit when installed in a groove.



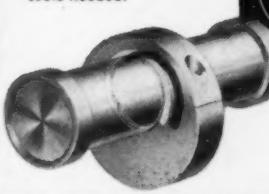
Beveled* and Bowded*

Take up end-play rigidly or resiliently, accommodate accumulated tolerances.



Crescent

Snaps on radially where axial assembly is impossible. No special tools needed.



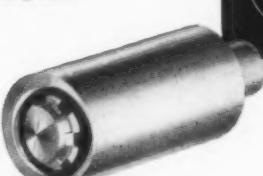
E-Ring

Provides large strong shoulder for small shafts. Applied radially.



Self-Locking*

Economical where thrust is moderate—holds fast, yet shaft requires no groove.



Interlocking

2-piece ring takes heavy thrusts, gives positive lock, secure against high RPMs.



Inverted*

For bearings with large corner radii, uniform shoulder for curved abutting surfaces.



COMPLETE ENGINEERING SPECIFICATIONS AND DATA, with 28 pages of charts for all standard types of Truarc rings, now available upon request. Data includes ring dimensions; housing and shaft dimensions; groove dimensions; thrust load capacities; materials; tensile strengths; types of finishes. There are charts supplying engineering recommendations and Truarc ring specifications for standard ball bearing assemblies.

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RETAINING RINGS

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WALDES TRUARC RETAINING RINGS ARE PROTECTED BY U. S. PATS. 2,302,948; 2,026,454; 2,416,052 AND OTHER PATS. PEND.



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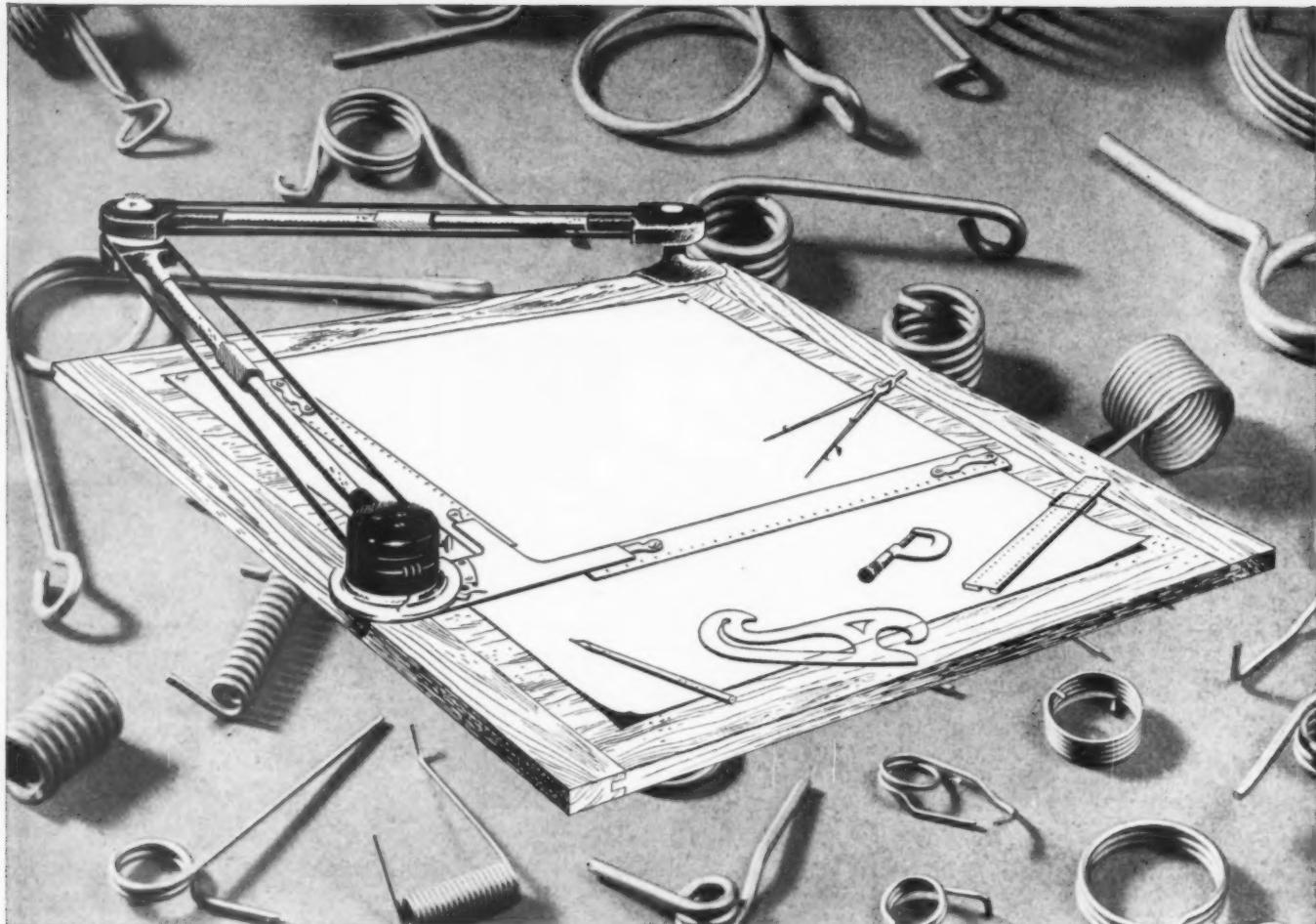
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Company _____

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City _____ Zone _____ State _____





BLANK PAPER . . . and an Idea

THE DESIGN of a satisfactory spring involves innumerable factors—load, deflection, size, shape, finish—to mention a few. Having determined these requirements, Wickwire Spencer engineers begin—with brains and blank paper—to establish the proper relationship between these factors and to design a spring that will stand up under the service requirements demanded.

The same exacting care that characterizes the design of springs and wire forms, is equally true as far as manufacturing procedures are concerned. Every coil of wire used in making springs undergoes exhaustive tests before manufacture. Skilled toolmakers set up machines

that make springs conform to exacting specifications. And finally, the springs are tested before shipment.

This beginning-to-end-control has saved time, trouble and expense for scores of manufacturers—has won many loyal customers for us. Our engineers are at your service in designing any conceivable type of wire spring or wire form. Why not write us? Also, we would like to send you our free book, "Springs and Formed Wires." It's free—and full of valuable data relating to spring selection and performance. Address your request to Spring Dept., Wickwire Spencer Steel Division of C. F. & I., 2 New Bond St., Worcester 6, Mass.



WICKWIRE SPENCER SPRINGS

A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION • THE COLORADO FUEL AND IRON CORPORATION

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PACIFIC COAST—The California Wire Cloth Corp., Oakland 6, Calif.



How does **SIMONDS** Pack so much "Stuff" into every Cutting Tool?



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... more than 5 acres of
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Conditions.

Simonds' Own Steel Mill guarantees the unmatched quality and uniformity of Simonds cutting edges.



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- 6 **Simonds 4-Company Organization**: All quality controlled from raw material to you.

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OF CONSISTENT CUTTING EFFICIENCY

LESS PARTS TO WEAR —



LESS WEAR ON PARTS

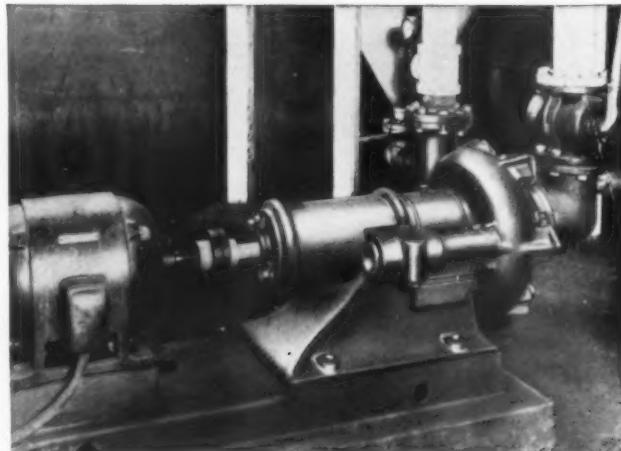
AMSCO-NAGLE PUMPS

CUT COSTS ON ABUSIVE APPLICATIONS

Only three Amsco-Nagle Pump parts are subjected to the brutal punishing of such material as abrasive sludge from the settling tank shown here. That's less parts to wear! The anti-friction bearings are completely sealed off from the water end.

The three parts—end plate, impeller and casing—are made of Amsco Manganese Steel. That's less wear on parts! "The toughest steel known" takes the roughest battering without fracturing . . . polishes and work-hardens to as high as 550 Brinell to fight abrasion. (For scouring abrasion without shock stress, Brake Shoe's ABK Metal has proved highly economical.)

There are other reasons why Amsco-Nagle Pumps cut costs handling ashes, sand and gravel, and abrasive mixtures of all types. When repairs and adjustments are eventually necessary, they're easier, less costly, less time consuming. Parts are simplified and accessible for easy maintenance. End plate attaches with clamping ring or



dogs. Impeller screws on. Supporting tubes on water end slip into sleeves on bearing housing for positive alignment. Stuffing box is quickly reached, from above or below, between supporting tubes. Send for Bulletin 547-IP.

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HELP ALL INDUSTRY BUILD GREATER PRODUCTIVITY



In the present postwar rush for greater production, there's a noticeable trend toward bigger machines with higher operating speeds. Thus more work is turned out, and V-Belts have to carry heavier loads and stand more punishment.

Bull Dog V-Belts are designed to meet these present day conditions. They're entirely new — not a rehash of old construction, but a brand new product developed in BWH laboratories to do your job better, for a longer time, at lower cost. Test runs in leading industries prove that Bull Dog V-Belts more than measure up to laboratory predictions of amazingly increased efficiency.

In the short time they've been on the market, Bull Dog V-Belts have won phenomenal acceptance. Here's why:

EXCLUSIVE BWH Bull Dog Cords have greater tensile strength.

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EXCLUSIVE BWH Covers of heavy, bias-cut material resist wear, protect against dirt, grease, moisture.

Specify Bull Dog V-Belts on your next installation. You'll be glad you did, when you see maintenance cost sheets and production records!

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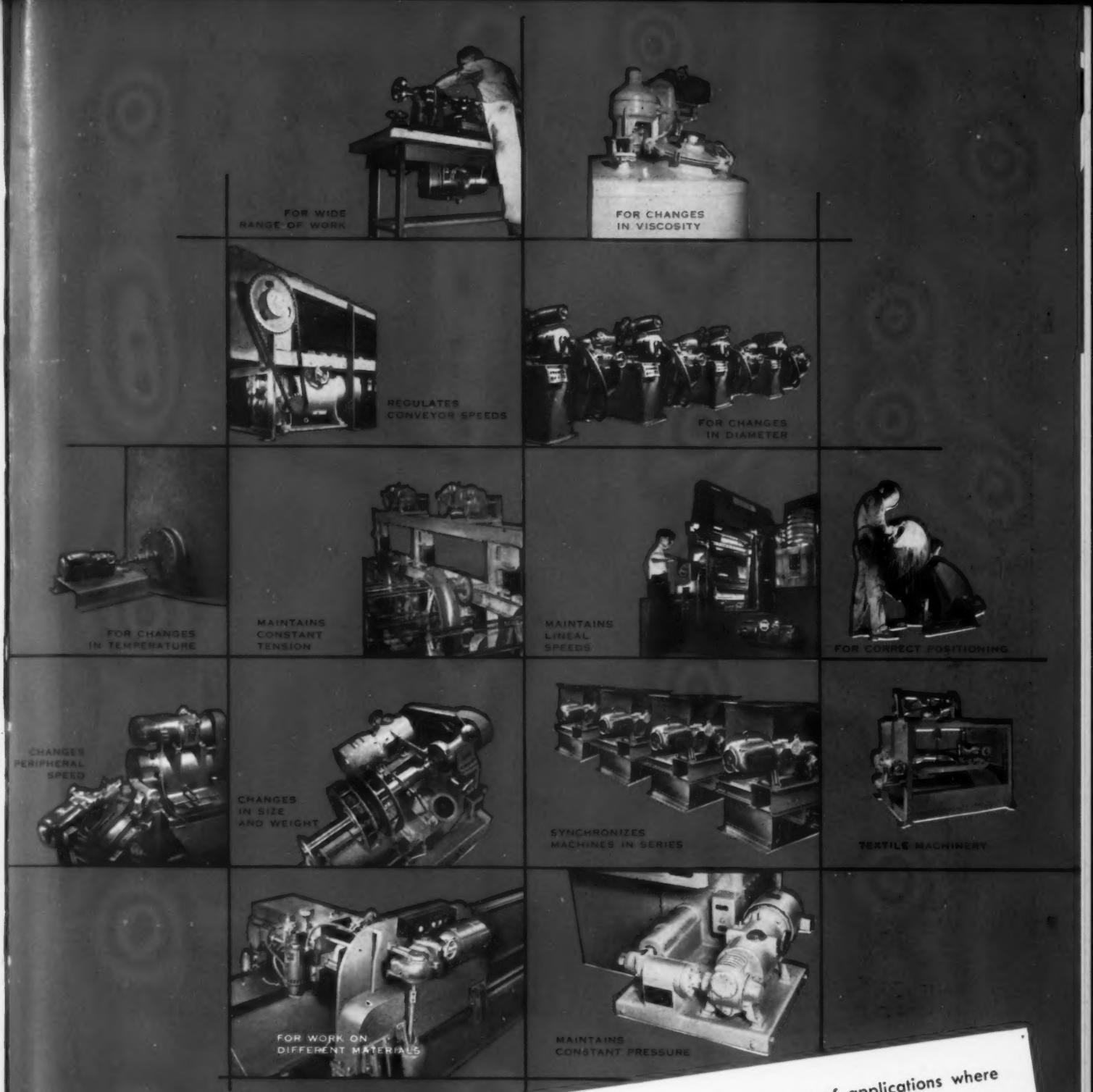
THEY MAKE WORK EASIER... in fact, American Phillips Screws make assembly a pleasure because, as one user says: "They're 3 times faster to find and drive!" And they're far easier to handle, to drive at angles, and into cranky inside corners. Any worker who "goes crooked" with slotted screws will "go straight" with American Phillips ... the only screw with the tapered, engineered recess. Fatigue is banished. Production stays up all day long. *And time-savings, too, stay up around 50%.*

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FOR WIDE RANGE OF WORK

FOR CHANGES IN VISCOSITY

REGULATES CONVEYOR SPEEDS

FOR CHANGES IN DIAMETER

FOR CHANGES IN TEMPERATURE

MAINTAINS CONSTANT TENSION

MAINTAINS LINEAL SPEEDS

FOR CORRECT POSITIONING

CHANGES PERIPHERAL SPEED

CHANGES IN SIZE AND WEIGHT

SYNCHRONIZES MACHINES IN SERIES

TEXTILE MACHINERY

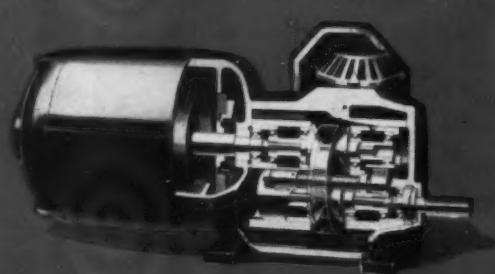
FOR WORK ON DIFFERENT MATERIALS

MAINTAINS CONSTANT PRESSURE

These are only a few of the many types of applications where Master Speedrangers are providing the correct range of variable speed for every operation . . . for every operator . . . or for each change in the consistency or shape of the material being processed. Such variable speed operation pays off in higher rates of production, a better quality product and more efficient performance of your equipment and your operators.

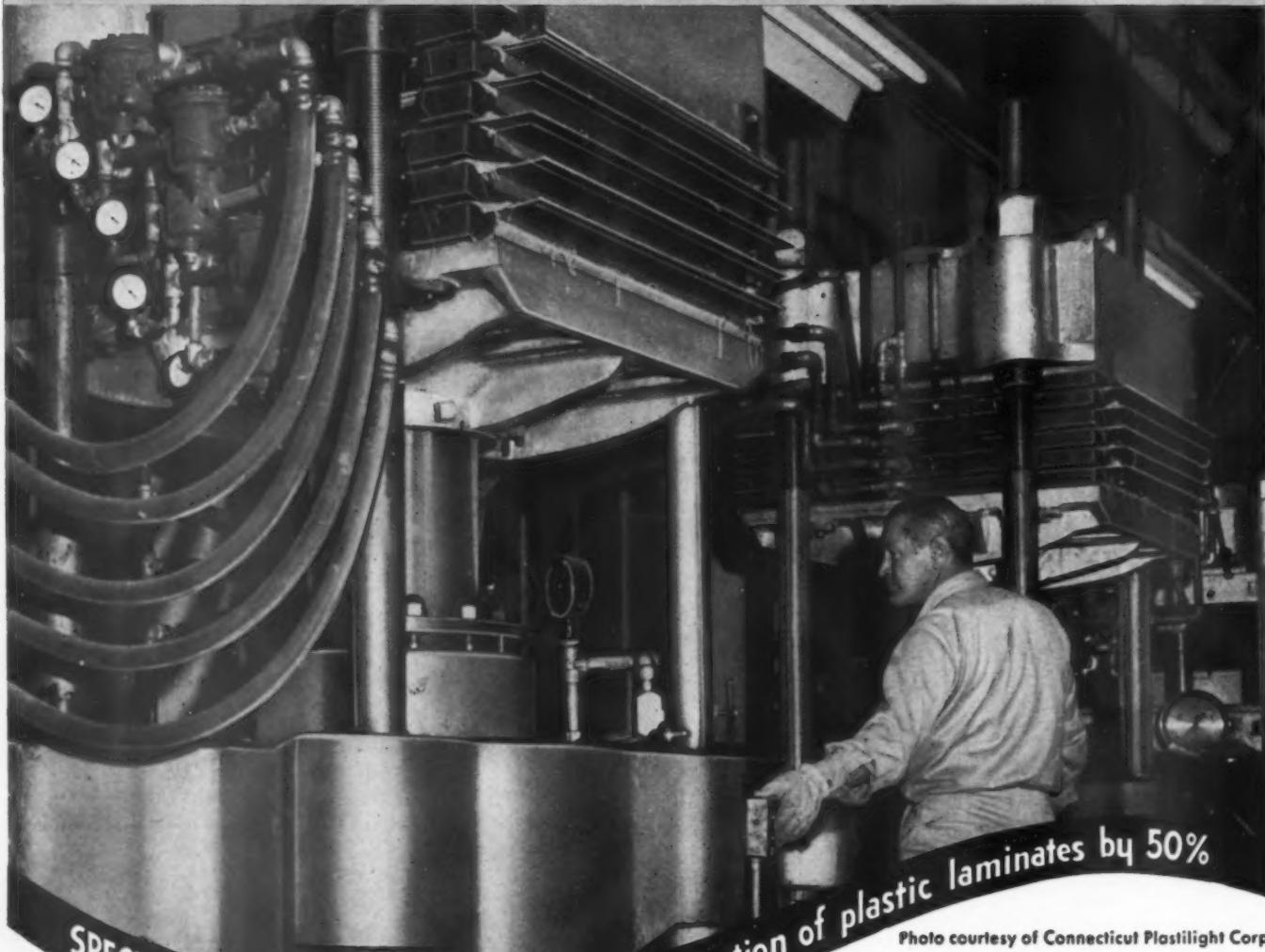
Write for Data 7525 . . . its 24 pages will show you how the compact, all metal construction of Master Speedrangers makes it easier for you to enjoy the many advantages of variable speed operation.

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO



Engineered Papers

RIEGEL-MADE TO YOUR SPECIFICATIONS



SPECIAL SEPARATING PAPER increases production of plastic laminates by 50%

Photo courtesy of Connecticut Plastilight Corp.

In each opening of these laminating presses there's a sheet of special Riegel Paper with the job of preventing the laminated table tops from sticking together—thereby boosting production by 50% as compared with previous separators.

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HOW TO SAVE LABOR AND POWER IN ROPE USE

PLYMOUTH
Lifesaver

Proper use of a few simple physical laws means greater safety to workers in using ropes for hoisting—and a dollar-wise saving of time, labor and power on the job. This series of pictures and formulas will enable foremen and workers to use blocks efficiently for lifting and moving heavy loads. Always remember that safe loads for rope are higher than those for blocks. See table on reverse side.

Determining the Proper Factor of Safety and Size of Rope for Tackle

To find the pull required to lift a given weight, when the number of parts at the movable block is known—the weight to be lifted by the tackle, divided by the number of ropes, or parts running from the movable block, will equal the necessary pull on the fall, theoretically.

But as there is always a friction loss around sheaves, a safe, but only approximate rule, is to allow 10% friction loss for each sheave 3" diameter and larger. Add this friction loss to the load and proceed as if friction were not present.

Let us assume 5,000 lbs. to be lifted by a tackle—two double

blocks—4 sheaves and 4 parts at the movable block.

$$4 \times 10\% = 40\%. \quad 5,000 \text{ lbs.} + 40\% = 7,000 \text{ lbs.}$$

$$7,000 \text{ lbs.} \div 4 = 1,750 \text{ lbs. necessary pull on the fall.}$$

Assuming a factor of safety of 5 to 1 as most desirable— $1,750 \times 5 = 8,750$ lbs. required tensile strength in the rope used.

Plymouth Manila Rope 1-inch diameter 3-inch circ. minimum break 9,000 lbs. is a safe rope to use. (See Plymouth Safe Working Loads for Tackle Blocks on reverse side.)



Single whip, 1 sheave. No mechanical advantage. 100 lbs. to be lifted.
 $1 \times 10\% = 10\%$ friction loss at sheave.
 $100 \text{ lbs.} + 10\% \times 100 \text{ lbs.} = 110 \text{ lbs.}$
 $110 \text{ lbs.} = 110 \text{ lbs. to lift the load.}$

A more accurate computation is as follows:
 $100 \text{ lbs.} = 111 \text{ lbs.}$
 $1 \times .90 = 111 \text{ lbs.}$



Single running block, 1 sheave. Mechanical advantage 2. 100 lbs. to be lifted.
 $1 \times 10\% = 10\%$ friction loss at sheave.
 $100 \text{ lbs.} + 10\% \times 100 \text{ lbs.} = 110 \text{ lbs.}$
 $110 \text{ lbs.} = 55.5 \text{ lbs. to lift the load.}$

Second method: $\frac{100 \text{ lbs.}}{2 \times .90} = 55.5 \text{ lbs.}$



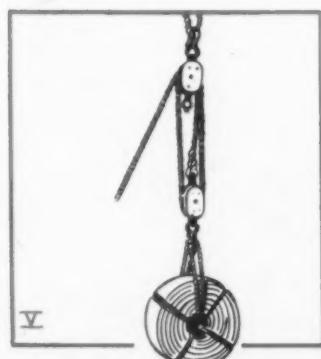
Gun Tackle. 2 single blocks, 2 sheaves. Mechanical advantage 2. 100 lbs. to be lifted.
 $2 \times 10\% = 20\%$ friction loss.
 $100 \text{ lbs.} + 20\% \times 100 \text{ lbs.} = 120 \text{ lbs.}$
 $120 \text{ lbs.} = 60 \text{ lbs. to lift the load.}$

Second method:
 $\frac{100 \text{ lbs.}}{2 \times .90 \times .90} = 61.7 \text{ lbs.}$



Gun Tackle. 2 single blocks, 2 sheaves—same number as Fig. III, but position of tackle reversed. Mechanical advantage 3. 100 lbs. to be lifted.
 $2 \times 10\% = 20\%$ friction loss.
 $100 \text{ lbs.} + 20\% \times 100 \text{ lbs.} = 120 \text{ lbs.}$
 $120 \text{ lbs.} = 40 \text{ lbs. to lift the load.}$

Second method:
 $\frac{100 \text{ lbs.}}{3 \times .90 \times .90} = 41.2 \text{ lbs.}$



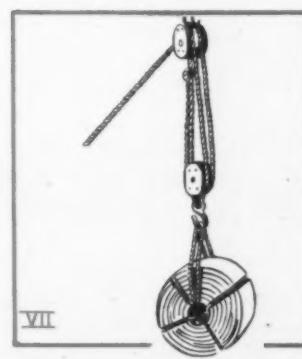
Luff or Watch Tackle. 1 single and 1 double block. 3 sheaves—3 supporting parts. Mechanical advantage 3. 100 lbs. to be lifted.
 $3 \times 10\% = 30\%$ friction loss.
 $100 \text{ lbs.} + 30\% \times 100 \text{ lbs.} = 130 \text{ lbs.}$
 $130 \text{ lbs.} = 43.3 \text{ lbs. to lift the load.}$

Second method:
 $100 \text{ lbs.} = 45.7 \text{ lbs.}$
 $3 \times .90 \times .90 \times .90 = 45.7 \text{ lbs.}$



Luff or Watch Tackle. Same as Fig. V, but position of tackle reversed. 3 sheaves. Mechanical advantage 4. 100 lbs. to be lifted.
 $3 \times 10\% = 30\%$ friction loss.
 $100 \text{ lbs.} + 30\% \times 100 \text{ lbs.} = 130 \text{ lbs.}$
 $130 \text{ lbs.} = 32.5 \text{ lbs. to lift the load.}$

Second method:
 $100 \text{ lbs.} = 34.3 \text{ lbs.}$
 $4 \times .90 \times .90 \times .90 = 34.3 \text{ lbs.}$



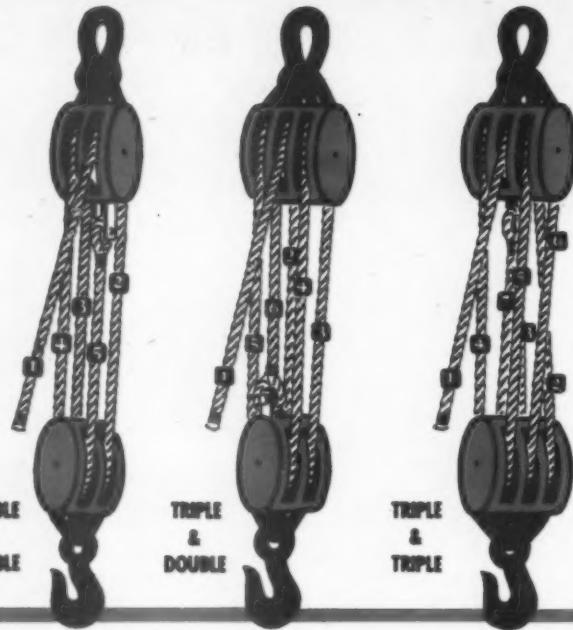
2 double blocks—4 sheaves. Mechanical advantage 4. 100 lbs. to be lifted.
 $4 \times 10\% = 40\%$ friction loss.
 $100 \text{ lbs.} + 40\% \times 100 = 140 \text{ lbs.}$
 $140 \text{ lbs.} = 35 \text{ lbs. to lift the load.}$

Second method:
 $100 \text{ lbs.} = 38.1 \text{ lbs.}$
 $4 \times .90 \times .90 \times .90 \times .90 = 38.1 \text{ lbs.}$



2 double blocks, same as Fig. VII, but position of tackle reversed. 4 sheaves. Mechanical advantage 5. 100 lbs. to be lifted.
 $4 \times 10\% = 40\%$ friction loss.
 $100 \text{ lbs.} + 40\% \times 100 = 140 \text{ lbs.}$
 $140 \text{ lbs.} = 28 \text{ lbs. to lift the load.}$

Second method:
 $100 \text{ lbs.} = 30.5 \text{ lbs.}$
 $5 \times .90 \times .90 \times .90 \times .90 = 30.5 \text{ lbs.}$



PROPER REEVING OF TACKLE BLOCKS

REEVING TACKLE BLOCKS

Lead line and becket line should come off a middle sheave when blocks contain more than two sheaves. The tackle should be reeved so that the upper and lower blocks will then be at right angles to each other, eliminating the tendency to tip and the accompanying losses in efficiency.

SAFE WORKING LOADS FOR COMMERCIAL BLOCKS

REGULAR MORTISE INSIDE IRON STRAPPED BLOCKS
FOR MANILA ROPE

HEAVY WIDE MORTISE BLOCKS
FOR MANILA ROPE

DIMENSIONS INCHES		WITH LOOSE SIDE HOOKS				WITH SHACKLES				DIMENSIONS INCHES		WITH LOOSE SIDE HOOKS				WITH SHACKLES			
LENGTH INCHES	FOR DIAMETER ROPE	DOUBLE AND SINGLE POUNDS	TWO DOUBLES POUNDS	TWO TRIPLES POUNDS	DOUBLE AND SINGLE POUNDS	TWO DOUBLES POUNDS	TWO TRIPLES POUNDS	LENGTH INCHES	FOR DIAMETER ROPE	DOUBLE AND SINGLE POUNDS	TWO DOUBLES POUNDS	TWO TRIPLES POUNDS	DOUBLE AND SINGLE POUNDS	TWO DOUBLES POUNDS	TWO TRIPLES POUNDS	DOUBLE AND SINGLE POUNDS	TWO DOUBLES POUNDS	TWO TRIPLES POUNDS	
3	3/8	200	300	400	400	800	1,200	6	3/4	1,500	2,000	2,500	1,600	3,000	4,000				
4	1/2	400	550	700	800	1,400	1,800	7	1	1,700	2,450	3,200	2,000	3,800	4,800				
5	5/8	500	750	1,000	1,100	1,700	2,100	8	1 1/8	2,200	2,900	3,600	2,400	4,700	6,700				
6	3/4	1,000	1,500	2,000	1,600	2,400	3,000	10	1 1/4	3,000	3,750	4,500	4,000	7,000	9,000				
7	7/8	1,500	2,000	2,500	2,000	3,000	3,700	12	1 1/2	3,600	4,800	6,000	5,000	9,000	12,000				
8	1	1,700	2,450	3,200	2,400	3,600	4,400	14	1 3/4	4,400	5,700	7,000	6,500	11,000	15,000				
10	1 1/8	2,600	3,400	4,200	4,000	5,400	6,400	16	2	6,000	7,500	9,000	8,000	14,000	18,000				
12	1 1/4	3,000	3,750	4,500	5,000	8,000	10,000												

These tables are shown through the courtesy of the Boston & Lockport Block Company and show suitable loads for one series of their standard and heavy blocks. These should be used as a guide only in ordering without assuming any responsibility, as the loads will vary between blocks in the manufacturer's line and as between blocks in other manufacturers' lines, and it should be also noted that these are suitable working loads for blocks and not for rope. Safe working loads for rope are higher than the safe working load for blocks.

FREE!

Plymouth will gladly mail you upon request additional copies of this valuable chart for every department of your plant or shop where tackle blocks are used. Foremen and workers will find it useful in protecting life and property—saving rope—cutting costs!

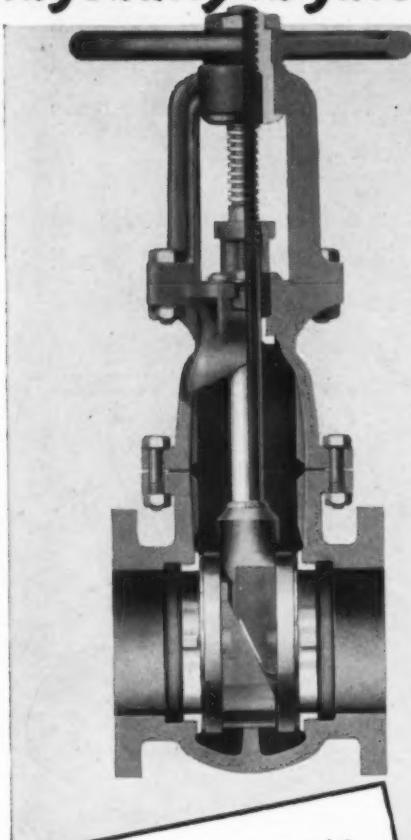
PLYMOUTH CORDAGE COMPANY, PLYMOUTH, MASSACHUSETTS. DISTRICT OFFICES: BOSTON, NEW YORK, CHICAGO, HOUSTON, SAN FRANCISCO. WAREHOUSE STOCKS: NEW YORK, BOSTON, PHILADELPHIA, BALTIMORE, HOUSTON, CHICAGO, SAN FRANCISCO. IN CANADA: SALES OFFICE—CORDAGE DISTRIBUTORS, LTD., TORONTO. MILL—WELLAND, ONTARIO.

PLYMOUTH
Cordage Products



THE ROPE YOU CAN TRUST BECAUSE IT IS ENGINEERED FOR YOUR JOB

Ingenuity in gate valve design fulfills seven objectives*



*This advertisement is one of a series showing how the unique Darling Fully Revolving Double Disc Parallel Seat Gate Valves answer the following critical operating problems:

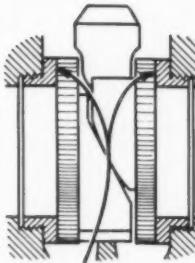
- Positive, easy closing—regardless.
- Automatic adjustment for valve body distortion.
- Elimination of disc-to-seat friction and galling.
- Uniform wear distribution.
- Extreme simplicity.
- Greater service life.
- Simplified maintenance.

1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000

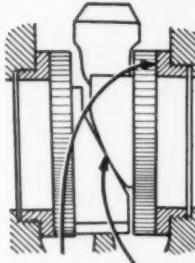
Darling Parallel Seat Gate Valves are available in a wide range of sizes and for all types of normal and unusual service, and for pressures up to 3000 pounds. Likewise, Darling Taper Seat, Solid or Slotted Wedge Gate Valves are available for most services.

Corrosion resistant valves. In addition to conventional iron, bronze and steel types, Darling specializes in valves for any corrosive fluid: iron body valves with special alloy trim; iron body, rubber lined, with special alloy trim; all bronze; and all special alloy. Darling's 60 years of experience in meeting unusual requirements is always at your service.

AUTOMATIC ADJUSTMENT for valve body distortion



Discs line up parallel with seats when valve is new.



Seat on right forced out of line by body distortion but disc adapts itself to give positive closing.

Curved face of wedge allows discs to adjust tightly against both seats.

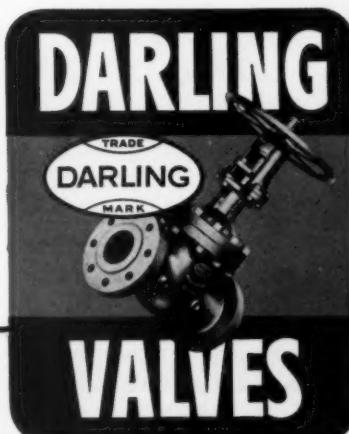
ALL valves regardless of size or construction are subject to body distortion—usually a continuous, although minute, process. The causes are many, including high temperature, high pressure, and line strains due to misalignment of piping. Whatever the cause, this distortion forces valve seats out of position and ordinarily means trouble . . . leaky valves, down-time, part replacements, and costly maintenance.

Now take a close look at the diagram above. Note how Darling's unique design automatically compensates for body distortion and the resulting misalignment of seats. The face of the upper wedge is radiused, while the adjacent side of the lower wedge is straight. Thus disc-to-seat pressure is always equalized, affording tight 360° seating despite horizontal or vertical changes in valve seat position.

So, for prolonged leak-free service, specify Darling Fully Revolving Double Disc Parallel Seat Gate Valves—the only valves embodying these design features.

DARLING VALVE & MANUFACTURING CO.
Williamsport 7, Pa.

Outline your needs and ask for specific data on the proper Darling Valves . . . or send for the complete 300-page Darling Catalog No. 17M. It describes Darling Valves of all types and is full of valuable information.



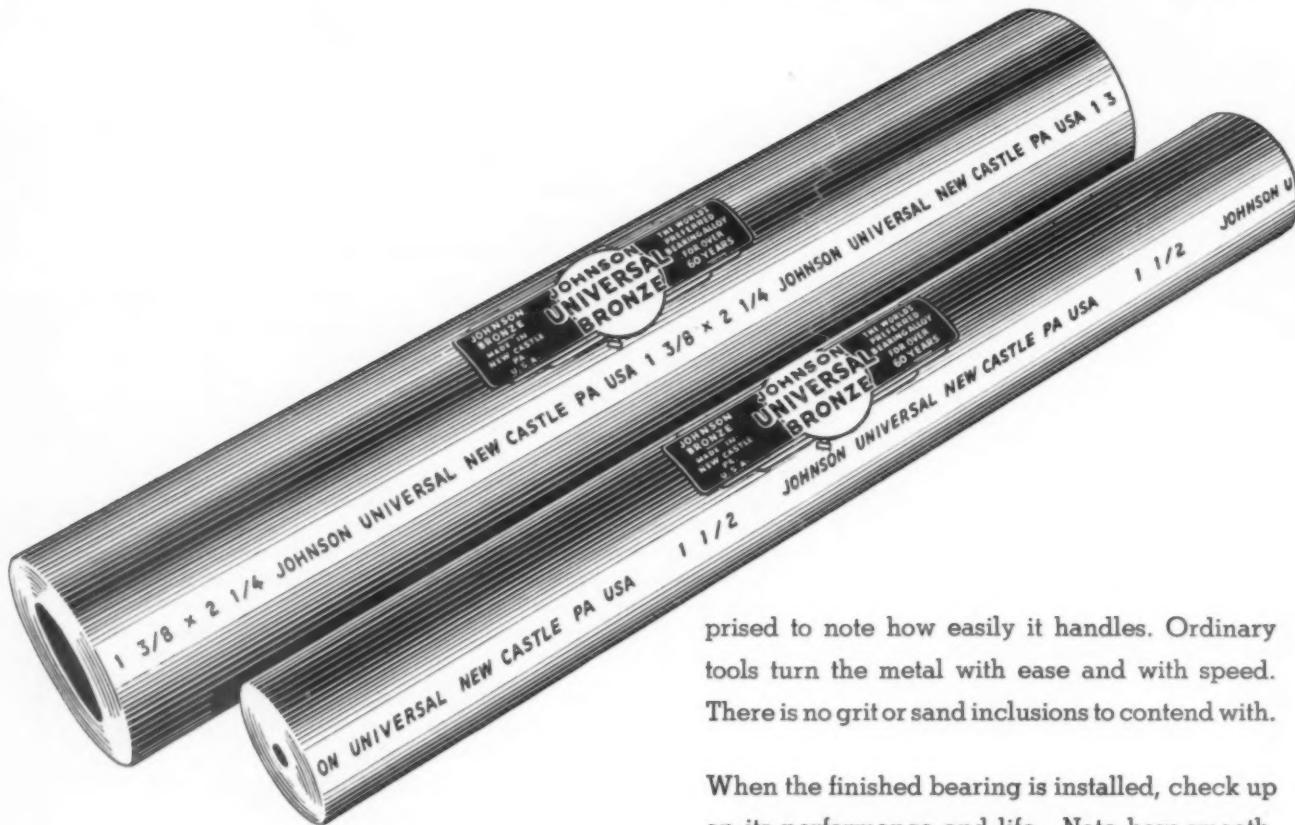
THE VALVE MARK OF QUALITY...WATCH FOR IT

YOUR GREATEST VALUE IN BEARING BRONZE

■ When you buy Johnson UNIVERSAL Bronze you buy much more than metal. You make a wise investment in bearing performance and economical bearing life. You save considerable money too.

First, you have the widest range of sizes to choose from . . . over 350 solid and cored. Every bar is completely machined, eliminating all extra work and guaranteeing perfection all the way through. Every Johnson UNIVERSAL Bar is entirely usable from end-to-end.

When you cut the bar you are pleasantly sur-



Catalogue

It's NEW . . . listing and describing the most complete bearing service in the market . . . and it's FREE.

prised to note how easily it handles. Ordinary tools turn the metal with ease and with speed. There is no grit or sand inclusions to contend with.

When the finished bearing is installed, check up on its performance and life. Note how smooth, how quietly it operates. Note also, the exceptionally long bearing life . . . the elimination of frequent replacement.

Why not try a bar on your next job? Your local Johnson Bronze Distributor carries a complete stock for immediate delivery.

JOHNSON
SLEEVE BEARING
450 S. MILL STREET



BRONZE
HEADQUARTERS
NEW CASTLE, PA.

USG HELPS YOU SELECT GAUGES

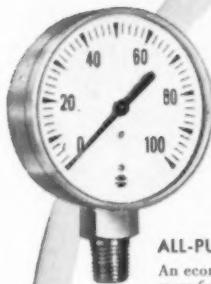
From the World's Largest Family of Instruments



SUPERGAUGE



ULTRAGAUGE



ALL-PURPOSE PRESSURE GAUGE

An instrument of test gauge accuracy, designed for many years of service in heavy-duty industrial installations. Withstands excessive vibration and pulsation and provides a safe positive check on process control.



REFRIGERATION GAUGE

Important features include: adjustable hub pointer, broad easy-to-read luminous dial, removable screw check. Low side gauge has 1" and 1 lb. graduation and is protected to 200 lbs. overpressure. Also available with external calibrator and retarded movement.



6 out of 10 Manufacturers Buy US Gauges



CHEMICAL GAUGE

Clean-Out Type

Designed for service in chemical and processing plants for use on heavy viscous fluids that tend to clog. Supplied with precious metal diaphragms and assemblies for highly corrosive chemical application. Diaphragm is easily removed for cleaning.

BOILER GAUGE

For use on hot water heating systems. Indicates on one dial: water temperature, head of water above gauge and pressure in system. Rugged construction with easy-to-read dial. Available in round or square case.



WELDING GAUGE

This well designed gauge incorporates the safety blow-out features in the low as well as the high pressures. It is especially designed to withstand rugged handling. It is a tough gauge for a tough job.

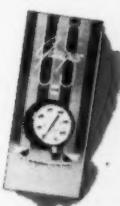


HYDRAULIC GAUGE

A gauge built to give continuing and accurate measurement of hydraulic pressures. The extra heavy-duty movement is designed to withstand the severe shocks and rugged service required of gauges when installed on hydraulic presses and Diesel engines.



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New Folder describing
many USG Products.



Clip and Mail This Coupon Today!

UNITED STATES GAUGE

DIVISION OF AMERICAN MACHINE AND METALS, INC.
SELLERSVILLE 25, PA.

Without obligation or cost please send me a copy
of your new helpful folder.

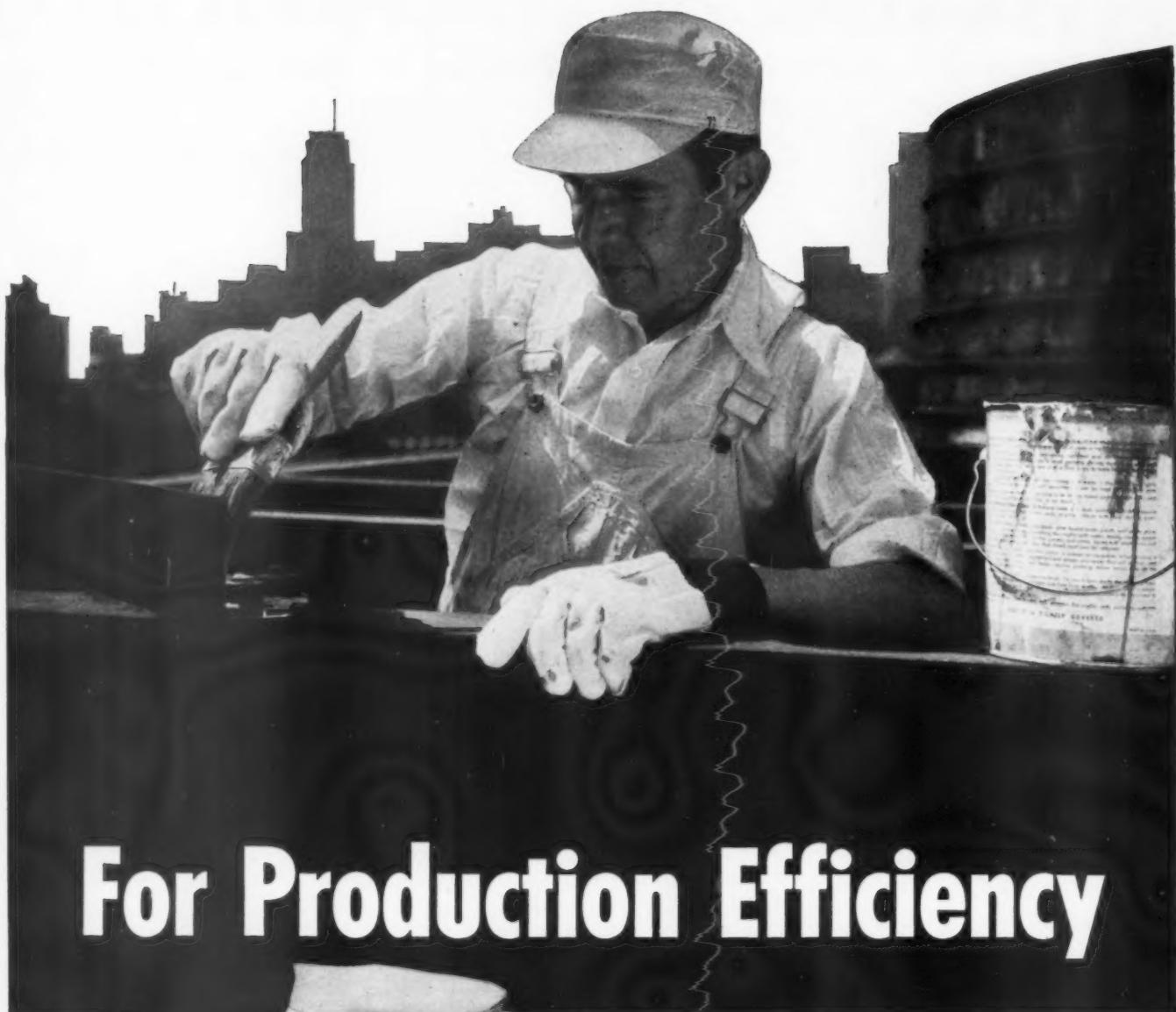
Mr. _____ Title _____

Company _____

Address _____

City _____ State _____

UNITED STATES GAUGE



For Production Efficiency



Production efficiency is the key to profits...and this applies to the farmer and the "little fellow" as well as to big business. Better work gloves help to promote better production efficiency, for skilled hands that work in comfort...with full protection . . . will do a better job.

Riegel Work Gloves are the best you can buy...comfortable, durable and economical...qualities made possible by complete Riegel control in one plant, from raw cotton to finished glove.

Riegel's Canton Flannel, clute pattern, is the basic volume seller. Made in 8, 10 and 12 oz. for men, and in an 8 oz. boys' and women's size. The 12 oz. glove is the longest wearing, most economical glove for the average worker.

Riegel
work gloves



WRITE FOR FREE CATALOG and list of distributors, to Riegel Textile Corp., 342 Madison Ave., New York 17, N. Y.

Are You Tapping—

✓ Plastics?

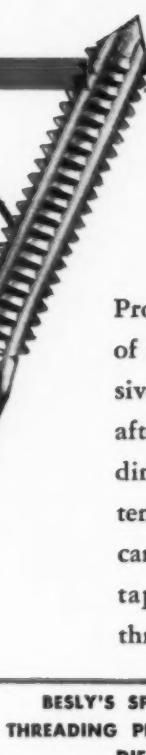
✓ Abrasive
Materials?

✓ Jobs That
Require Plating
After Tapping?

✓ Die Castings?

✓ Sheet Metal?

BESLY
TAPS



HELPFUL
FACTS FOR
TAP USERS



Ask for free copy of
valuable manual with
information on taps
and tapping, and list-
ings on drill sizes and
tap fits.

BESLY'S SPECIALLY TREATED TAPS FOR
THREADING PLASTICS, ABRASIVE MATERIALS,
DIE CASTINGS, ETC. GIVE:

Abrasive Resistance —



Special Surface treat-
ment to increase tap
life.

Free Cutting —



For automatic screw
machine work.

Free Fit —



To accept
Gauge after
plating.

Free Assembly —



With power screw
drivers.

Besly's "Helping Hand"
has 5 Strong Fingers



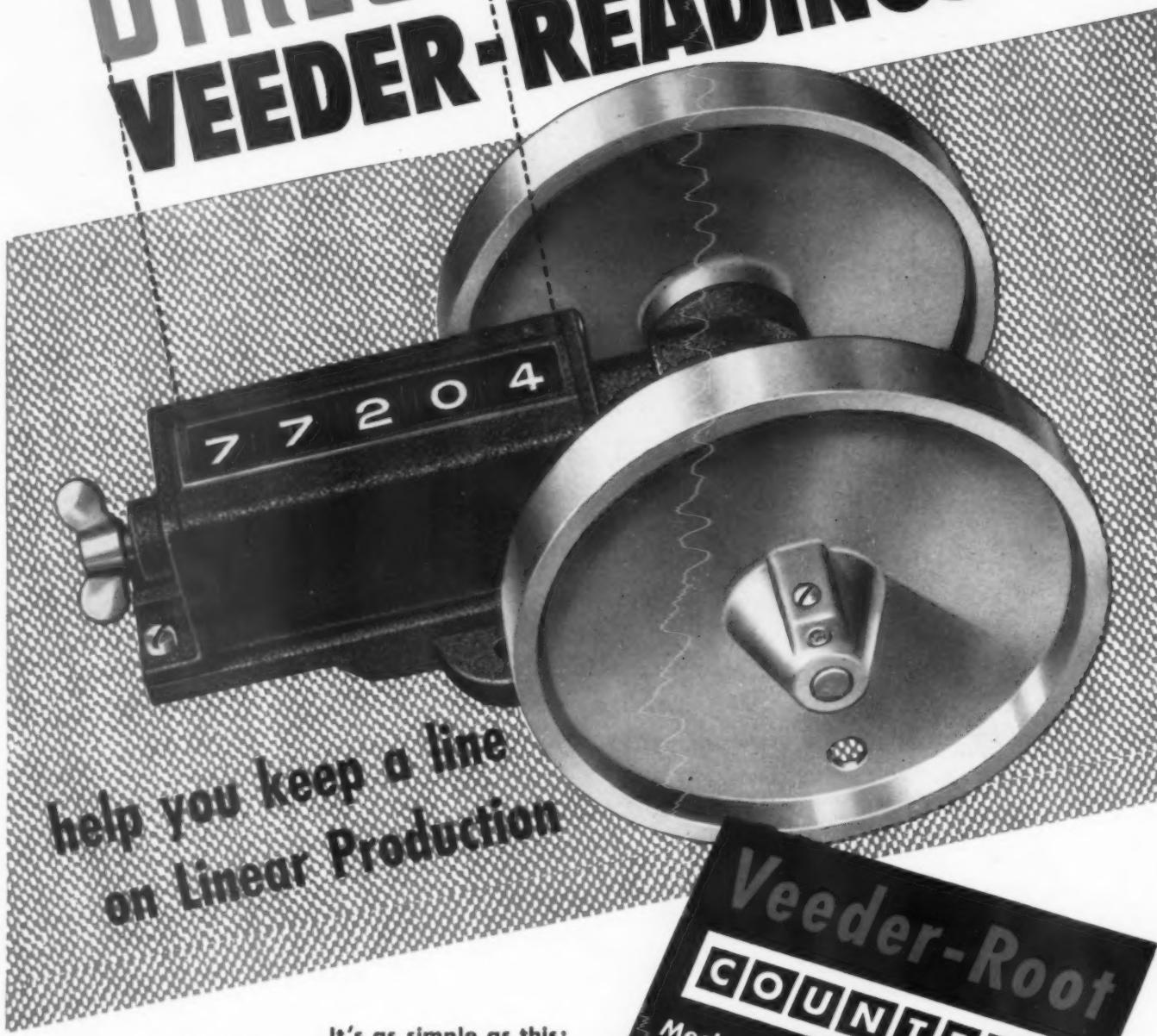
- Fast Delivery
- A Complete Line
- Top Tap Quality
- Engineering Counsel
- Qualified Distributors

BESLY

BESLY TAPS • BESLY TITAN ABRASIVE WHEELS
BESLY GRINDERS AND ACCESSORIES

CHARLES H. BESLY & COMPANY • 118-124 North Clinton Street, Chicago 6, Illinois
Factory: Beloit, Wisconsin

DIRECT VEEDER-READINGS

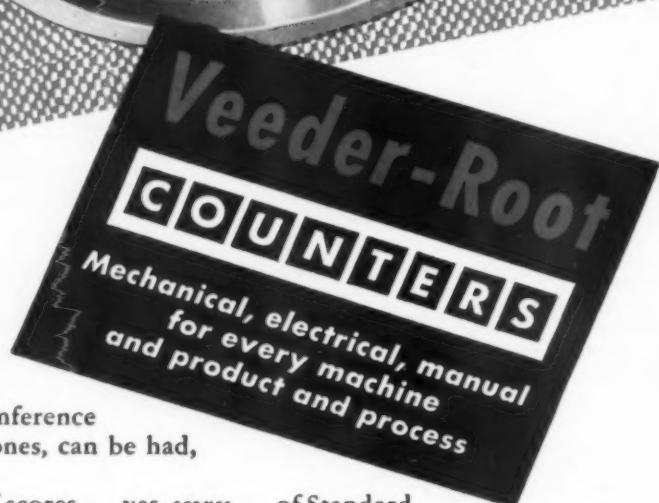


help you keep a line
on Linear Production

It's as simple as this:

Textiles and other materials pass under the smooth-surfaced twin wheels. And the worm-drive gears inside the counter cause the 5 figures to indicate directly in yards, feet, meters, or other units. The wheels are one foot in circumference . . . and other types of wheels, even grooved ones, can be had, for other purposes and materials.

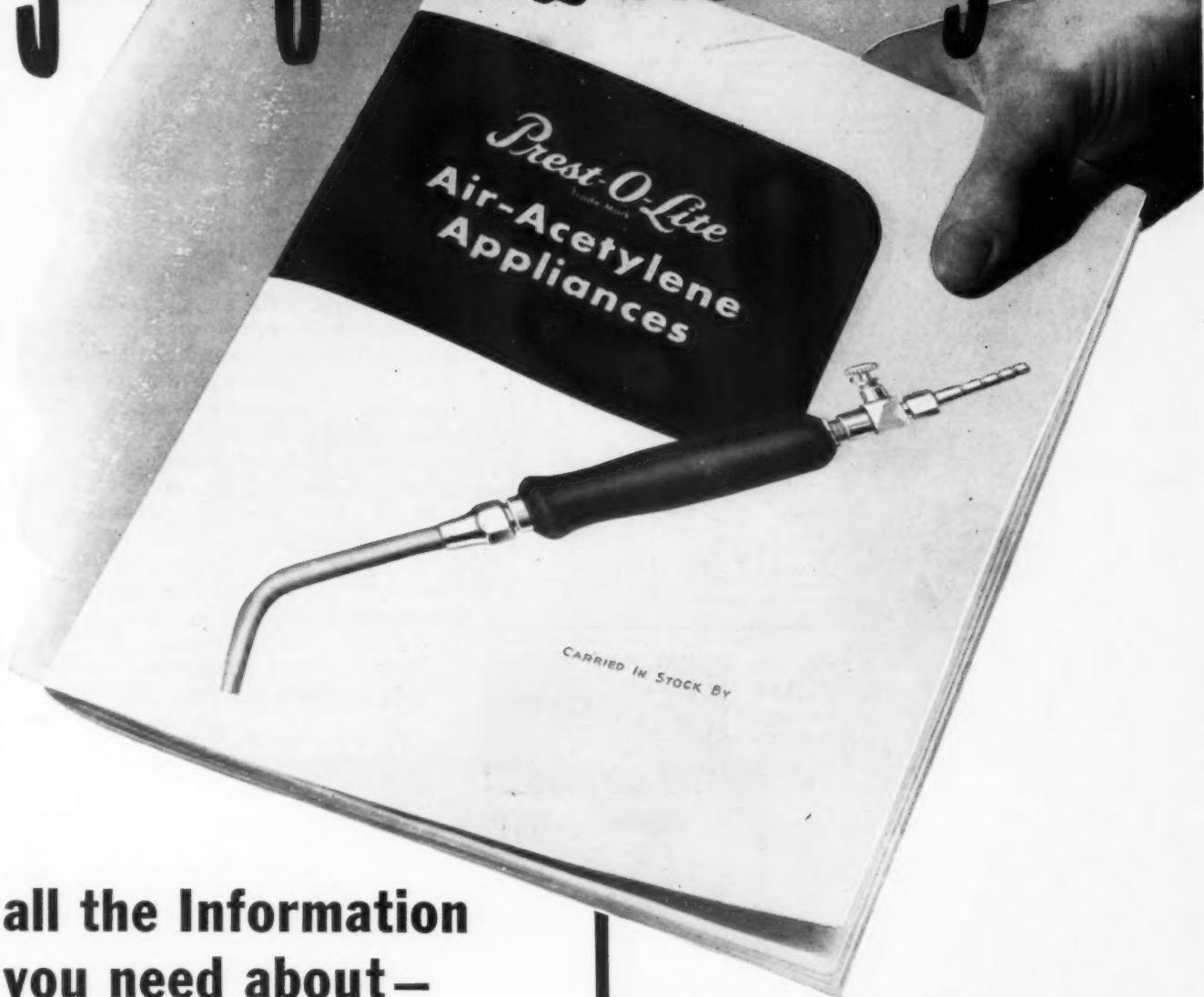
This Reset Worm-Driven Counter is one of scores . . . yes, *scores* . . . of Standard Veeder-Root Counters which count in terms of linear units, pieces, revolutions, strokes, operations, trips, volumes, light-flashes, hand-movements, or anything else you want to count. And if a Standard Veeder-Root Counter won't meet your needs, then "Counting House" engineers can design a special counter that *will*. You can count on that . . . *write*.



VEEDER-ROOT INC., HARTFORD 2, CONN.

In Canada: Veeder-Root of Canada, Ltd., 955 St. James Street, Montreal 3
In England: Veeder-Root Ltd., Dickinson Works, 20 Purley Way, Croydon, Surrey

Yours for the Asking



**all the Information
you need about—**

**SOLDERING,
HEATING, AND
BRAZING EQUIPMENT**

18 Popular Outfits . . . 34 Torch and Soldering Iron Combinations . . . Regulators . . . Floodlights . . . Adaptors . . . Parts and Accessories.

How to make up an outfit to meet your exact needs. Where and how PREST-O-LITE Appliances save time and money . . . do better work.

YOUR Copy Is Ready NOW . . .

See Your **Prest-O-Lite** Jobber
Trade-Mark

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"Prest-O-Lite" is a trade-mark of The Linde Air Products Company
Unit of Union Carbide and Carbon Corporation.

Date _____

THE LINDE AIR PRODUCTS COMPANY

Apparatus Sales Division, 30 East 42nd Street
New York 17, N. Y.

Please send me, without obligation, a copy of the new 20-page PREST-O-LITE Catalog, F-6995.

Please send me the names and addresses of PREST-O-LITE Jobbers near me.

Name _____

Company _____

Street Address _____

City _____ Zone _____ State _____

New Toolroom Technique

**Grinding precision-spaced holes in hardened steel
no longer rated time-eater as P&W Jig Grinder takes over**

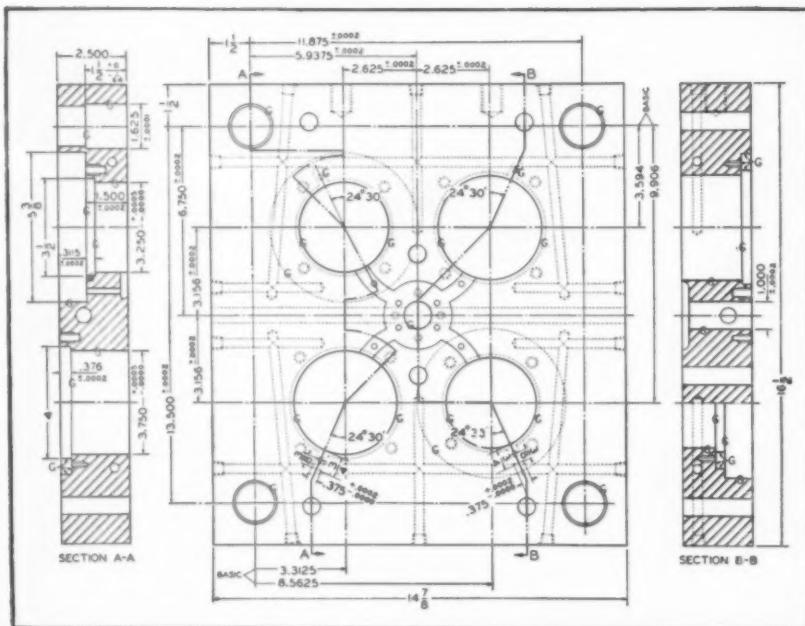


Diagram shows one-half of a hardened die casting adapter made for Veeder-Root, Inc., long famed for its precision die castings. Accurate grinding was essential because sixty different round dies must fit *interchangeably* and accurately into these holes.

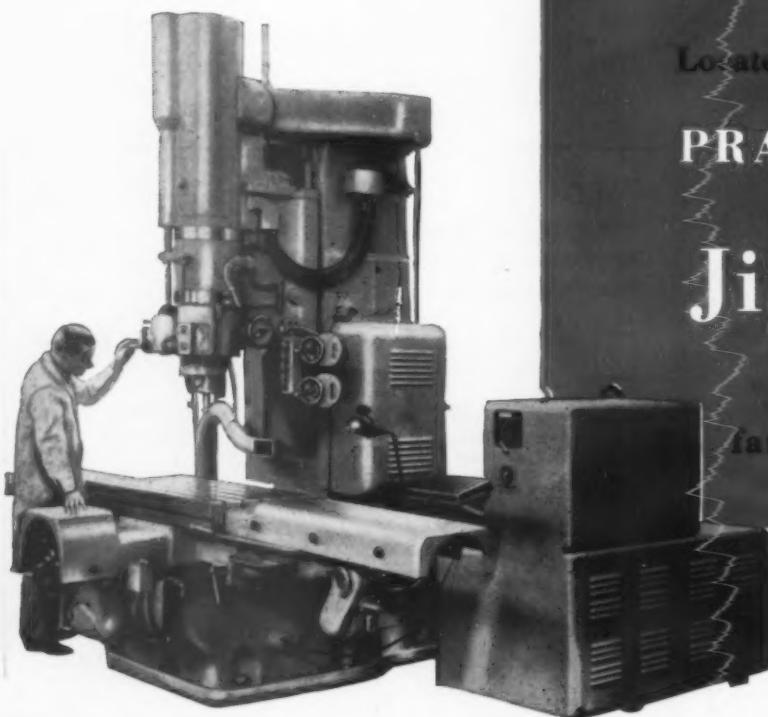


Examining this "blueprint," any tool engineer would ordinarily guess two or three weeks for grinding all the holes, shoulders, and key slots in this piece to the close tolerances demanded. Yet it took only fifty hours (including set-up time) to grind all those holes and slots, in steel hardened to 50 C Rockwell.

This record was set by P&W's new all-electric Jig Grinder. Companion to P&W's Jig Borer, this machine combines a powerful vertical grinding machine with the P&W Jig Borer's method of precision locating. The result is a new machine which locates, grinds, and checks its own work — to "tenth" precision — on hole spacing, diameter, and depth. And, with a rapid metal removal rate and a wide range of spindle speeds up to 54,000 R.P.M., the Jig Grinder opens the way to many jobs otherwise prohibitively expensive or impossible. It will pay any tool engineer to investigate.

For a complete, illustrated case history of this precision grinding job, write

PRATT & WHITNEY
Division Niles-Bement-Pond Co.
WEST HARTFORD 1, CONNECTICUT



Locates + Grinds ◊ Checks ◊
PRATT & WHITNEY
ALL-ELECTRIC
Jig Grinder

Companion to the
famous P&W Jig Borer



"There is no better-paying investment
than the right tools for the job"

DO YOU KNOW?

By Using BEMIS TITE-FIT TUBING

YOU

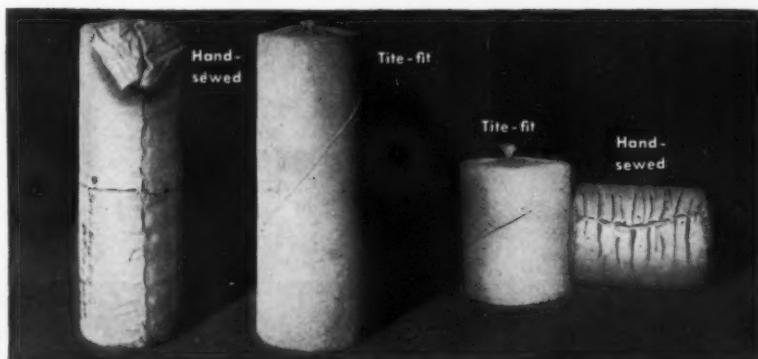
REDUCE labor and material costs, because you:
ELIMINATE handling heavy bales of burlap.
ELIMINATE time required to open bales and remove bale coverings.
ELIMINATE time required to cut burlap into sheets.
ELIMINATE using more burlap than necessary.
ELIMINATE all hand sewing.
IMPROVE the appearance of your rolls.

YOUR CUSTOMERS

RECEIVE neat packages that are easy to handle, because there's a handy ear on each end.

SAVE TIME as TITE-FIT TUBING is easily and quickly removed. Just untwist wire tie at one end and slip tubing off.

ELIMINATE chance of cutting into contents and damaging goods, as no cutting of sewing thread or goods is necessary.



This versatile tubing fits almost any shape and a wide range of package sizes. One roll may cover many different diameters and lengths neatly, without waste because TITE-FIT TUBING has stretch in both directions.



BEMIS BRO. BAG CO.

Brooklyn 32, New York



Canadian Bag Co., Montreal, and the Ontario Bag Co., Port Colborne, Ontario, are licensed manufacturers of TITE-FIT TUBING in Canada.

5 QUICK STEPS

That's all it takes when you package with Tite-Fit Tubing



1. Pull tube well down over object, leaving an overage to cover bottom.



2. Turn package on side and fasten tube at bottom with a wire tie.



3. Turn package upright and use both hands to take up slack.



4. Fasten top with a wire tie close to object to assure tight fit.



5. Cut off the Tite-Fit Tubing about 3 inches above the wire tie.

MAIL COUPON NOW

Bemis Bro. Bag Co.
5132 Second Ave., Brooklyn, N. Y.

Send descriptive folder on TITE-FIT TUBING
 Send sample. Our packages are approximately _____ inches in circumference. (Please specify)

Name _____

Firm _____

Street _____

City _____ Zone _____ State _____

For AIR or GAS at
Constant Pressure!



Allen-Billmyre
CENTRIFUGAL TYPE
Blowers and
Exhausters

- Inherently
Self-Governing
- Quiet and
Vibrationless
- Only One
Moving Part . . .

Power consumption varies with the load and a constant pressure is maintained through the entire capacity range.

Only two bearings—located well outside of the housing—require lubrication.

External bearings assure clean dry air at all times.

Ample clearances permit normal quantities of dust to pass through the machine without harmful effect.

The impeller assembly—the only moving part—is accurately balanced.

Allen-Billmyre Blowers and
Exhausters are highly efficient
for Agitation and Aeration . . .
Manufacture of Gases, Acids
. . . Combustion Processes
. . . Conveying . . . Cooling and
Ventilation . . . and all low
Pressure and
Vacuum Requirements
Made in wide range of sizes
for $\frac{1}{2}$ to 200 HP

FREE!

Send for Bulletin B-5. Describes Blowers and Exhausters . . . their application and specifications.

ALLEN-BILLMYRE DIVISION

LAMSON
CORPORATION
415 Lamson St. Syracuse, N.Y.

F.O.B. philosophy of buying

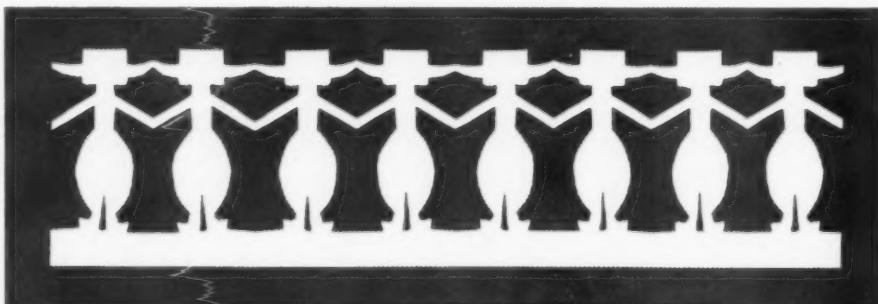
DIVERSIFICATION of industry is strikingly illustrated in a description of the Kaiser Steel Mill at Fontana, California, recently appearing in the San Diego *Union*. The story brings out the fact that 730 acres of the 1300-acre plant are devoted to agriculture, so that the products of the enterprise can accurately be listed as oranges and steel. Income from the sale of agricultural products is used to finance the landscaping program, which is an important part of company policy, resulting in a parklike setting that has made the plant one of the industrial showplaces of Southern California.

Beauty and Red developed blood clots from being struck by stones tossed into the pool by observers.

CITY P. A. James Baker of Grand Rapids had the \$64 question put to him very literally this summer: "When does a 12-foot plank cost \$64?" The answer: "When it's a diving board." For that was the average bid from four concerns on replacements for 24 springboards at the City's swimming pools. Mr. Baker is disinclined to do business at \$64 a plank, and promptly instituted a one-man campaign to reduce the high cost of diving.

PURCHASING is a service department, but it is not often that the P. A. is called upon to serve the Lonely Hearts Department. City Purchasing Agent Fred Eretz of Rochester, N. Y., recently received a requisition from the Park Department calling for two (2) *zalophi californianus* (*pinnipedia*)—sea lions to you—as playmates for Pat, sole survivor of the group living at Seneca Park Zoo. Apparently there is an occupational hazard in this business. Within the year, little Rochester cut himself fatally on a pop bottle, and

A STUDY of industrial buying practices has been undertaken by the National Industrial Advertisers Association. Preliminary reports presented at the recent annual convention indicate that purchasing agents consider an average of three makes per item purchased, use printed information before calling in the salesmen in 60% of their purchases, determine which salesmen they wish to see in 48% of the cases by study and comparison of trade literature.



OUR most original mail continues to originate with Clem Caditz of the Northern Metal Products Company, Chicago. (See F.O.B. in the issues of May and December, 1947, and June, 1948.) The latest envelope disclosed a strip of paper dolls, traditionally the product of the more advanced wards in our mental

institutions. The message, hand printed across the base of this masterpiece of scissors art, said:

F.O.B.

Dear Friend:—

I enjoyed that article in the June issue—Of course I'm not having any trouble getting steel! -

CLEM CADITZ

More than 80% of purchases, according to this study, result from internal influences such as plant expansion, improvements, and replacements, rather than from the external influences such as advertising, sales calls, trade shows, etc. It comes back to the fundamentals often repeated in these columns, that industrial purchases are made to satisfy a need, that there are usually several alternative products that will satisfy the need, that good purchasing seeks and uses competition in arriving at a decision, and that industrial buyers are keenly interested readers and users of informative advertising.

DEMOCRACY at work is exemplified by a front page story in the New York *Journal of Commerce* stating that the "National Association of Manufacturers and the Association of American Railroads disclosed that they will comply *in part* with the lobbying statute which orders that receipts and expenditures governing the influencing of legislation be listed with Congress. . . . In addition, the United States Chamber of Commerce, the AFL and the CIO are expected to reach a decision soon on what step they would take to comply with the Justice Department demand."

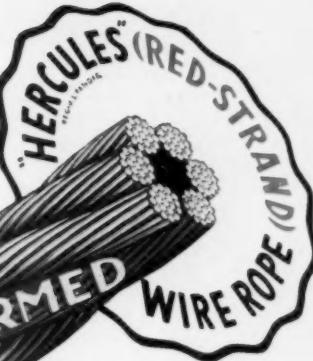
BUYERS' market conditions are indicated in the report of the New York Quartermaster Purchasing Office, showing bids on QM invitations amounting to quantities ranging all the way from 100% to 1700% above total requirements. The New York *Times* patriotically comments that "loyalty to country is the determining factor which compels answering bid invitations," and realistically adds: "Trade spokesmen readily admit, however, that the lag in civilian business for certain categories of goods has made the Army business appear attractive."

ALSO on the buyers' market side is the metal platinum, which tumbled from \$98 to \$75 per ounce within ten days in June, ending a rising market of several months standing. Reasons ascribed for this development concern the two chief purchasing fields for this material. The manufacturing jewelry trade went on vacation for the greater part of July, and military orders for precision instruments and aviation electrical equipment failed to materialize as expected.

*Longer Life
Lower Costs*

WHEN YOU USE

PREFORMED



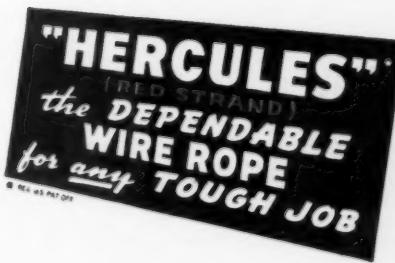
Verifiable
**FACTS About
PREFORMED
PERFORMANCE**

1. Broken wires lie practically flat — reduce possibility of injury.
2. Greater flexibility . . . smoother spooling . . . faster handling.
3. Preforming reduces tendency of Lang Lay wire rope to loop and squirm.
4. Wires and strands are shaped to normal form occupied in rope — this means less turning and twisting . . . less wear . . . longer life.

Flat-Laced

Wire Rope Slings
Write for Bulletin
No. FLS-48

Outstanding quality is never a matter of chance, consequently there are definite reasons for the consistent top-flight performance of Preformed "HERCULES" (Red-Strand) Wire Rope. Material . . . design . . . experience . . . fabrication . . . preforming — all are contributing factors that add up to its plus value, which mean longer life and lower operating costs.



MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS
5909 KENNERLY AVE.

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LOS ANGELES 21 • PORTLAND 9

ESTABLISHED 1857
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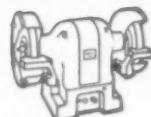


*If You're
Doing JOBS
Like These...*



PORTABLE GRINDER FEATURES:

- Splined gear mountings for perfect power transmission.
- Steel bearing inserts for smoother running.
- Welded steel wheel guard for extra safety.
- Complete abrasive dust protection for vital parts.
- PLUS dependable B & D-built "constant speed" motors



BENCH GRINDER FEATURES:

- Streamlined design for more work clearance and less weight.
- Adjustable U-shaped tool rests for better tool sharpening support.
- Strong steel wheel guards for extra safety.
- 8" and 10" Bench Grinders equipped for dust collecting systems.



USE PORTABLE GRINDERS FOR:

- Preparing surfaces for welding and smoothing welds.
- Snagging and grinding castings.
- Cutting off old rivets, studs, bolts.
- Removing rust, scale, old paint from tanks and structural metal.
- Grinding, cleaning and buffing frames, cabinets, other assemblies.

USE BENCH GRINDERS FOR:

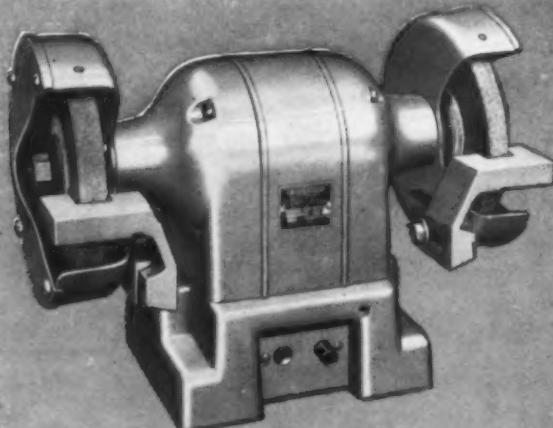
- Sharpening cold chisels, wood chisels, twist drills and many other tools.
- Handling many types of grinding and metal removal.
- Removing rust; cleaning dirty, gummy parts; preparing surfaces for painting.
- Buffing and polishing plated metal surfaces.

*..You'll Want
Black & Decker
Features
Like These..*

**For TOP Performance
from the FINEST
Bench and Portable
Grinders MADE!**



4" Portable Grinder... \$66.00 5" Model... \$80.00 6" Model... \$100.00



BENCH GRINDERS

6" Standard	8" Heavy-Duty
\$38.00	\$98.00
6" Heavy-Duty	10" Model
\$58.00	\$138.00

Select a Black & Decker Portable Grinder if you want to *bring the tool to the work!* Select a Black & Decker Bench Grinder if you want to *bring the work to the tool!* Whatever your particular need, you'll get years of top-notch service out of these husky, well-built Black & Decker Tools . . . while saving time and money in a hundred-and-one grinding jobs! Give your nearby Black & Decker Distributor a ring for full details on these hard-working Grinders. And write for our free catalog to: The Black & Decker Mfg. Co., 664 Pennsylvania Ave., Towson 4, Maryland.

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Black & Decker
PORTABLE ELECTRIC TOOLS

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Purchasing Previews

A Washington Report for Purchasing Agents



September 1, 1948

NO GREAT STRAIN ON MATERIALS SUPPLY

Present pace of military procurements will not create any major strain on supply of materials, according to service purchasing agents. There will be an increase in the take of steel—largely spotted in plates going to the Navy.

The aviation program will not gather sufficient momentum to create a material supply problem until well into next year.

Military procurement of textiles will not be much of a factor, since purchases have been made by the services considerably ahead of their needs.

Food purchases will not create a problem. There was a period when military purchase of meats in a tight market created a considerable strain on meat supply. The procedure now is more elastic, and this will eliminate the strain on the nations meat supply.

FIGURES ON VOLUNTARY ALLOCATIONS OF STEEL

Voluntary agreements program now shapes up to a point where all programs which have been established by the Division of Industry Cooperation—as well as those in prospect—will take a steel tonnage of not more than 10% in excess of 1947 total production. This takes care of the military needs, housing, atomic energy projects, the petroleum industry and railroads. New steel finishing capacities will increase production potential by about 5%.

Steel company officials are optimistic that the voluntary agreements program will work smoothly, without denying the so-called non-essential consumers of a reasonable supply of steel.

The big problem is in specific forms of steel. Forty percent of the total plate output is under allocation in the voluntary agreements program.

GRAY MARKET IN STEEL DRYING UP

Industry acceptance of the voluntary agreements program is increasing.

There had been a tendency on the part of a number of industrial consumers to hang back on the program as their supply of steel seemed adequate. Manufacturers now have taken the view that voluntary allocation is the lesser evil when contrasted to full-scale controls.

There is some indication that the so-called gray market in steel is on the way out, and possibly the voluntary allocations program is in part responsible for this trend. The allocations program is a direct relationship between the consumer and his immediate source of supply, which tends to eliminate illegitimate middle-man dealings.

Obviously, new pressures will be created in industries which do not have an industry program to obtain steel.

INDUSTRY CAUTIOUS ON INVENTORIES

Lag in sales during the first quarter of this year resulted in a sharp increase in the rate of inventory accumulation, and although sales picked up during the second quarter, industry and business have maintained a more cautious approach toward inventories.

Postwar replenishment of depleted inventories has by and large been accomplished. The Government view is that there has been no general speculative over-expansion of inventories, plant and equipment, or housing.

The postwar plant and equipment boom has shown significant changes of pattern. During the first stages the pressure was on replacement of facilities and restoration of civilian output. Now, there is increasing emphasis on cost reduction and the substitution of new products and techniques.

FOREIGN AID WILL NOT GREATLY STRAIN U. S. SUPPLY

Impact of foreign aid program on supply of materials for domestic requirements will not be as drastic as initially predicted.

Domestic position of grain and other foodstuffs will be aided materially by unusually good cereal crops in Western Europe, and reports of record grain crops in Eastern Europe and Russia will substantially increase the world food supply.

This, coupled with the likelihood of record crops of both wheat and corn in this country, will mean adequate (if not surplus) food and feed supply in the U. S.

Major decreases in volume of export are anticipated in the total export of fats and oils, freight cars, electrical machinery and apparatus, petroleum products and coal.

The rate of steel exports during the remainder of this year will be higher than during the first half of the year, but will be lower than in 1947.

STOCKPILING PROGRAM IS ACCELERATING

Procurement for the nation's strategic material stockpile is beginning to increase, with the big impact still to come.

Congress has authorized \$800,000,000 for stockpile procurement, but of this sum, only \$100,000,000 has been spent.

A major consideration in stepping up the stockpiling program has been that all of the so-called strategic materials required for the stockpile are similarly needed in the defense production industries, and are in many instances the major materials required in civilian production.

Until now, the stockpiling program has been retained because major considerations were (1) not to impede reconversion of industry, and (2) not to cut down civilian production which would reflect on employment.

These considerations are likely to weigh less heavily in shaping up the stockpiling program during the period ahead. Defense needs will tend to outweigh civilian industrial requirements.

PRICE TRENDS STILL AN "IFFY" PROBLEM

Price trends remain a matter for speculation. The continued spiral of increased wages and prices has led to periodic price plateaus of short duration. Feeling has been widespread during these periods that any further adjustment would be downward.

For the last several years when a leveling off of prices occurred, some new stimulus has been introduced which has swung the balance in favor of a new upward thrust in prices.

The factor that tipped the scales for higher prices was the urgency of organizing an adequate defense program and foreign relief. It was obvious that large-scale output of munitions and an unprecedented foreign aid program could not be sustained in a period of sharp labor-management strife.

Also, with a universal grab for materials, no group of major processors could sit back and let the materials flow elsewhere while their plants shut down.

So the ability to resist a third round wage increase was diluted beyond the resistance point. Now there is a new wave of pessimism that the economy cannot sustain the current high level of prices. The period of testing as to whether prices will be moderated or will go higher will continue.

No decision is likely until after the elections, but in the meantime, business is taking a cautious approach toward inventories and purchase commitments, taking into account the high level of income and spending.

How packaging time was cut

40%

Read how Acme Steelstrap and Acme methods help tool manufacturer cut packaging material costs 88%

The Multi-Shear Lawn Edgers pictured here are made by Appliance Manufacturing Company, Santa Ana, California.

Old cost for packaging six units was 27¢, with 5 minutes' packing time.

Then an Acme Shipping Specialist suggested the method of packaging you see here—two wood strips "Bound to get there" with Acme Steelstrap. Cost, 3 1/4¢; time, three minutes. Saving, 88%.

Pennies saved per packaging unit mean dollars on your books at the end of the year. Acme Shipping Specialists are ready to help you get them. For more information—and detailed case studies of how we have helped other companies—just clip and mail the coupon for the free booklet, "SAVINGS IN SHIPPING."

STRAPPING DIVISION

ACME STEEL COMPANY

Acme Steelstrap

NEW YORK 17 ATLANTA CHICAGO 8 LOS ANGELES 11



MONEY SAVING AND PRACTICAL—just three minutes is all it takes to package six lawn edgers with Acme Steelstrap for a saving of 88% over previous package cost.

Acme Steel Company, Dept. P-98
2838 Archer Avenue, Chicago 8, Illinois

Please send me a copy of your case history booklet, "SAVINGS IN SHIPPING."

Name.....

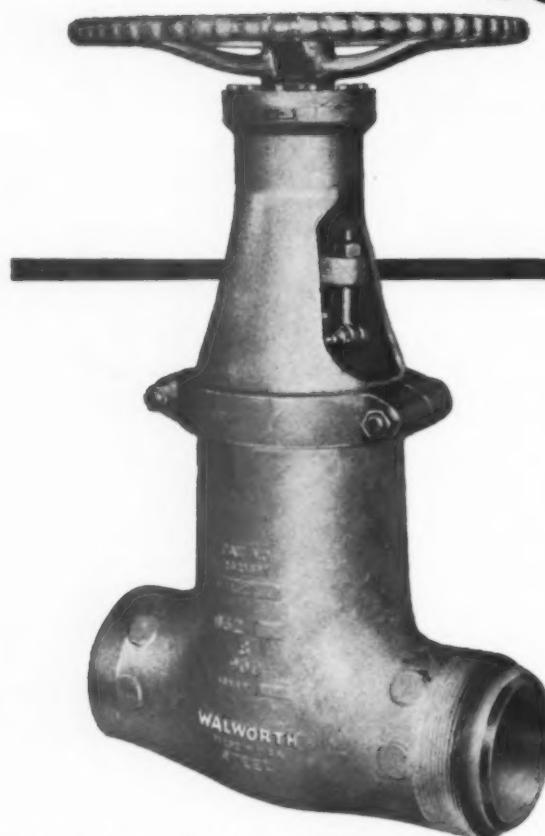
Company.....

Address.....

City..... Zone..... State.....

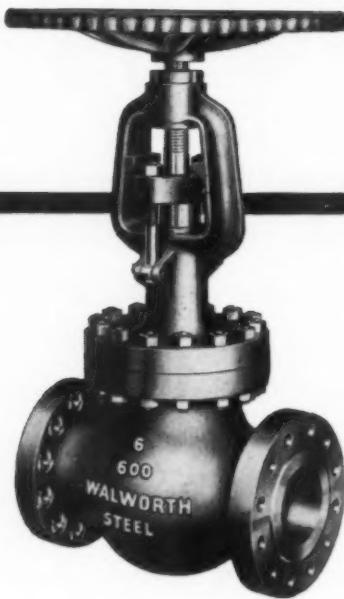


Walworth Series 150 Cast Steel Valves are tough and wear-resistant. Gate valves are available in sizes from 2" to 24", and globe valves in sizes 2" to 12".



Walworth Pressure-Seal Cast Steel Gate Valves exemplify the greatest improvement in high-pressure, high-temperature valve design. The internal pressure keeps the body-to-bonnet joint tight. Series 600: 1½" and larger — Series 900: 3" and larger — Series 1500: 1" and larger.

**Years of
trouble-free service
assured with . . .**



Walworth Series 600 Cast Steel Valves have strength and ability to resist wear. They assure long life and positive operation. Available in either gate or globe types — Gate: sizes 1½" to 18" — Globe: sizes 2" - 8".

WALWORTH cast steel valves

Walworth Cast Steel Valves have proved their ability to assure years of trouble-free, dependable service. Accurately threaded stems, deep stuffing boxes, streamlined ports, and heavy cast alloy steel walls are their top features.

You can get full information about Walworth's complete line of steel, iron, and bronze valves and fittings from our new Catalog 47. See your nearest Walworth distributor, or write on business stationery for your free copy.

Walworth Cast Steel Fittings are manufactured in a wide range of types and sizes to meet every requirement. They are made to the highest standards of quality, both as to dimensional accuracy and metallurgical properties.

WALWORTH valves and fittings

60 EAST 42nd STREET, NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

HOW YOU CAN HELP TO *Increase* YOUR COMPANY'S SALES

In modern manufacturing organizations, sales departments alone should not be charged with the full responsibility for sales. Every department of a company — yes, and every individual is a potential factor of increased sales.

How can you help boost *your* company's sales? Here's a suggestion: if your product uses bearings, buy Timken Tapered Roller Bearings.

Buy Timken Bearings, first, because they make equipment of every kind perform better; last longer; cost less for operation and upkeep.

Buy them, second, because there is a persistent, universal preference for machines that are Timken Bearing Equipped. This preference is a selling force you cannot afford to ignore. It transcends every other buying consideration except the advanced design, superior material (Timken Alloy Steel); and engineering, metallurgical and manufacturing experience (49 years) inherent in every Timken Bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address "TIMROSCO".

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION





NOW!

SEYMOUR Free Machining NICKEL SILVER ROD

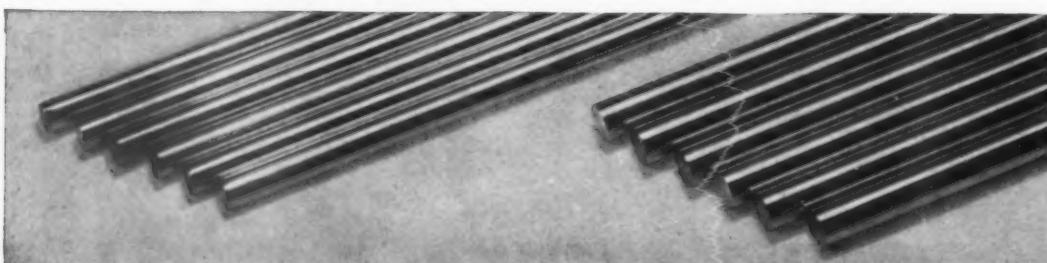
Stock Sizes Available
for **PROMPT SHIPMENT**

Rod sizes from $\frac{1}{8}$ " to 2" diameter, in 10%, 12%, 15% and 18% Seymour Leaded Nickel Silver, are now in stock to meet your immediate production requirements. For improved deliveries on larger quantities, we have broken down various bars at ready-to-finish sizes. This means substantial shipments can be on their way to you within two or three weeks.

Seymour Leaded Nickel Silver Rod has excellent machinability, resistance to corrosion, a high tensile strength and an attractive silvery white color. It is preferred for screw machine products used in optical goods, jewelry, dental appliances, fishing tackle, and thousands of other applications. For complete specifications, properties and uses, write for your complimentary copy of our new catalog on Seymour Nickel Silver.



THE SEYMOUR MANUFACTURING COMPANY
SEYMOUR, CONNECTICUT



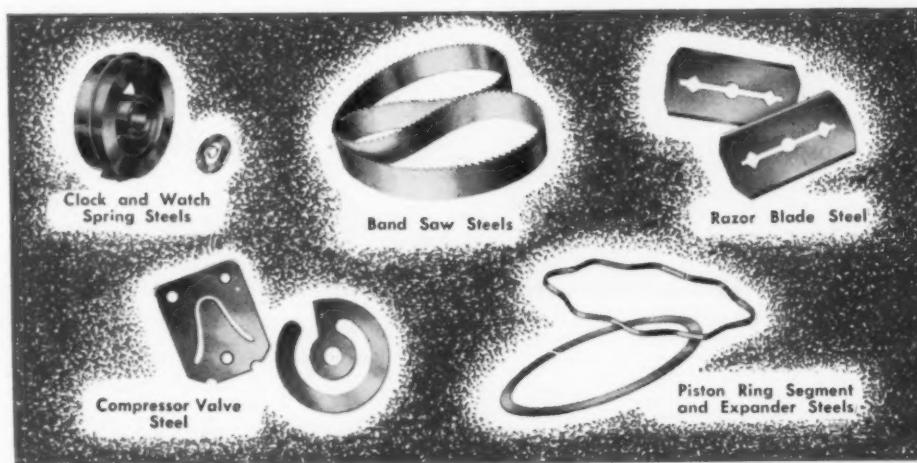
why SANDVIK spring steels are named after their jobs . . and what it means to you

SANDVIK cold-rolled, spring steels are *specialized* steels. By analysis, gauge, width and finish, each type is fitted to a specific service.

In fact, from SANDVIK you can get spring steel that is practically "custom-tailored" to meet the demands of your application.

SANDVIK high carbon and alloyed strip steels are supplied:

- In special analyses for specific applications
- Annealed, unannealed or hardened and tempered
- Precision-rolled in thicknesses from .001"
- With bright finish or blue or yellow polished
- With round edges or square edges
- In a wide range of widths



SOME SANDVIK SPECIALTY SPRING STEELS

Band Saw Steels • Camera Shutter Steel • Clock and Watch Spring Steels • Compressor Valve Steel • Doctor Blade Steel • Feeler Gauge Steel • Flapper Valve Steel • Knife Steels • Matrix Band Steel • Piston Ring Segment and Expander Steels • Razor Blade Steel • Reed Steel • Shock Absorber Steel • Sinker Steel • Spring Steels • Textile Steels • Vibrator Reed Steel

Next time you have a problem in spring steel, consult SANDVIK. Phone or write for complete information, technical advice or current stock lists.



SANDVIK STEEL, INC.

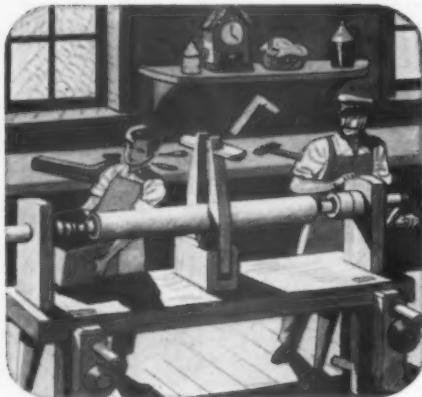
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180 N. Michigan Ave., Chicago 1, Ill., FRanklin 1745

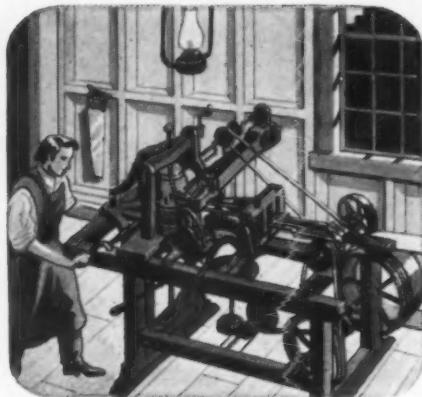
1736 Columbus Rd., Cleveland 13, Ohio, CHerry 2303

WAREHOUSES: New York and Cleveland

SS-31



1 1827—Early machine tools were a result of shop owner and mechanic tinkering around, trying to step up output. They were hand built, crude, and no two machines were alike, since measurements were not yet standardized.



2 1855—Gradually, methods and techniques became more uniform, more exacting. Machine tools developed for one industry were tried successfully in others. But the *real* power behind machine tools, low-cost electricity, was still to come.



3 1915—Howell "Red Band" Electric Motors appeared. Applied to lathes, grinders, cutters, shapers and other machine tools, these rugged, industrial-type motors soon won wide acclaim for making good on hard jobs.

THEN, AMERICA TOOLED-UP!



4 Today—Machine tools, operated by skilled workers, help put more goods in the hands of more people, at less cost!

America is really tooled-up! And Howell Motors have helped. In thousands of shops, they are recognized as tops for the tough jobs.

These dependable precision-built motors are also an important source of power for pumps, fans, conveyors and other vital industrial equipment.

Are you using Howell Motors?

Free enterprise encourages mass production, supplies more jobs—provides more goods for more people at less cost.

Here's another precision-built Howell Motor . . . industrial type with copper or bronze bar rotors . . . specially insulated . . . statically and dynamically balanced.

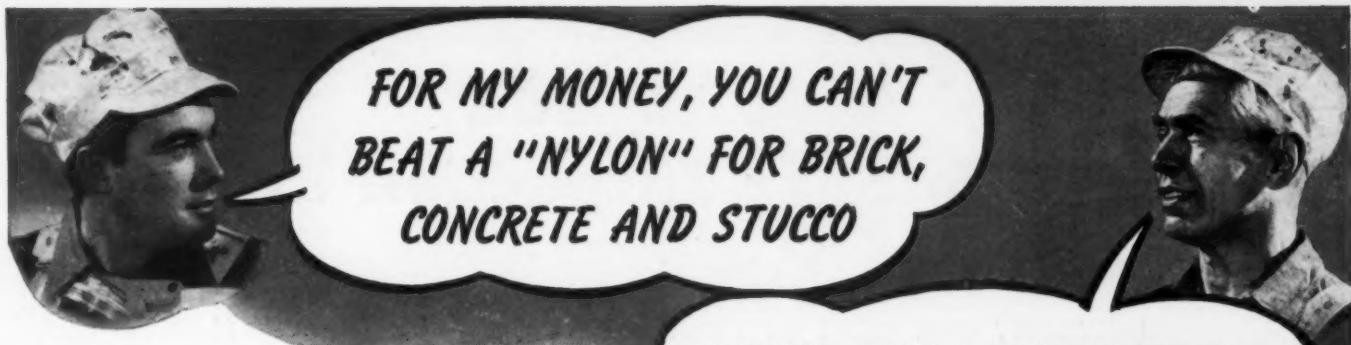


Howell Protected Type Motor

HOWELL MOTORS

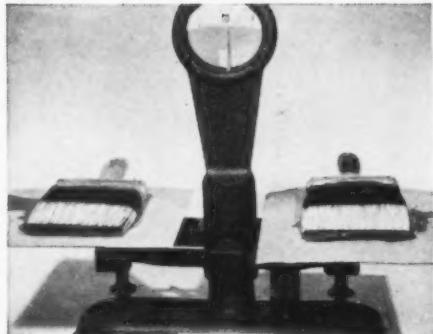
HOWELL ELECTRIC MOTORS CO., HOWELL, MICH.

Manufacturers of Quality Industrial Type Motors Since 1915



Every job can be a top-quality job with

NYLON-BRISTLED PAINTBRUSHES



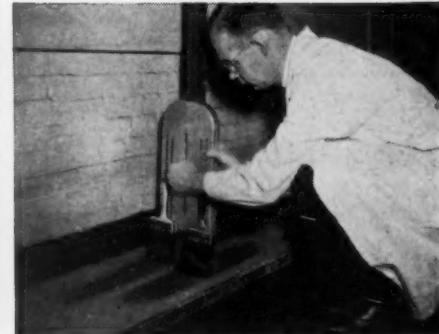
NYLON REALLY HOLDS PAINT

Nylon bristles of various lengths can be blended and sanded to hold paint as well as or better than any others. Above, brushes with nylon bristles and pure animal bristles of equal dry weight were dipped to same depth in paint. Weighing after simultaneous removal showed nylon holds more paint!



NYLON LAYS IT ON S-M-O-O-T-H

Each nylon bristle is tapered and sanded to a fine tip, to control the smoothness of the painted surface. In the test above, identical surfaces were painted with a nylon-bristled brush and an animal-bristled brush. The magnified view shows that nylon bristles lay down a smoother, finer coat!



NYLON BRISTLES LAST FAR LONGER

Nylon-bristled brushes continue on the job long after others have failed. Wear-test machine above imitates painter's stroke. At the start, both nylon bristles and natural bristles were of equal length. But after one million strokes, the nylon bristles showed less than one-fifth the wear!

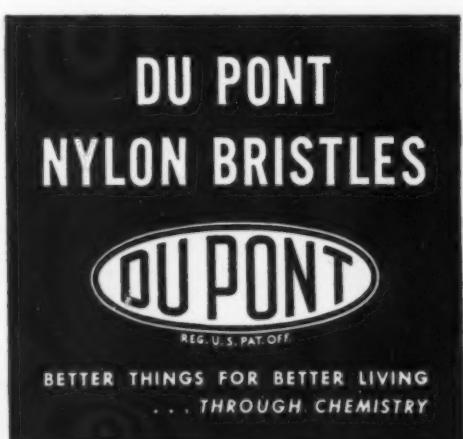
More and more painters are buying nylon-bristled brushes

Whether it's rough exterior work or fine interior trim—painters get a top-quality paint job with nylon-bristled brushes. For properly made

nylon brushes really hold paint . . . turn out as smooth a job as you ever saw. And they not only paint better—they'll save you money, too! Nylon bristles outwear others 3 to 5 times—save 40 to 80% of brush costs. That's been proved over and over again, in laboratory tests and on the job.

But . . . be sure to look for the

words NYLON BRISTLES stamped clearly on the brush handle. Because there's no substitute for nylon! Clip coupon below for free copies of our helpful new booklet, "How you can save money on the job with paintbrushes bristled with DU PONT NYLON." E. I. du Pont de Nemours & Co. (Inc.), Plastics Dept., Room 849, Arlington, N. J.



CLIP THIS COUPON NOW!

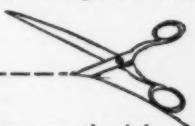
Du Pont, Plastics Dept., Room 849, Arlington, N. J.

Please send me () copies of "How you can save money on the job with paintbrushes bristled with Du Pont Nylon."

Name _____ Firm _____

Address _____

City _____ State _____



How to Add Complete Rubber Inspection Facilities to Your Plant

[WITHOUT ONE CENT OF INVESTMENT BY YOUR COMPANY]



View at left shows several of a specially trained staff of inspectors at the Willoughby, Ohio factory of The Ohio Rubber Co. An almost infinite variety of small mechanical rubber parts are checked to customers' specifications in this department.

Another inspection department at the Willoughby, Ohio plant of The Ohio Rubber Company is shown at the right. In other inspection and testing departments (not illustrated) special equipment designed by our engineers is employed.



• If you had a complete mechanical rubber manufacturing department in your own plant, you would need various types of special testing machines and the trained services of inspectors and supervisors. All are available to you here at The Ohio Rubber Company without one cent of investment by your company. • When you refer your

requirements for mechanical rubber goods to us, you start into action a complete organization of specialists in manufacturing to customers' specifications. Ask us to have our sales representative in your area explain the details of how well we are prepared to work with you and for you on every phase of mechanical rubber manufacturing.

This is the 8th of a series of messages relating to:

THE OHIO RUBBER COMPANY
304 BEN HUR AVE., WILLOUGHBY, OHIO

FACTORIES: WILLOUGHBY, OHIO • LONG BEACH, CALIF. • CONNEAUTVILLE, PA.
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**Get More Production
Per Man with ...**

**CURTIS
AIR HOISTS**



The speed, ease of handling and accurate control of Curtis air-powered Hoists and Cylinders step up production.

Wherever a lifting, pulling or pushing operation is involved, CURTIS Air Hoists save time and labor; cut load-handling costs.



Curtis Air Hoists provide:

- Low original cost
- One-man operation
- Immunity to abuse by overloading
- Capacities to 10 tons
- Light weight
- Lowest operating expense
- Finger-tip control
- Pendant, bracketed or rope-compounded types

*Send for Bulletin C-7 on Curtis Air Hoists,
Air Cylinders and Air Compressors.*

CURTIS

PNEUMATIC MACHINERY DIVISION

of Curtis Manufacturing Company
1908 Kienlen Avenue . . . St. Louis 20, Missouri

94 Years of Precision Manufacturing

CURTIS PNEUMATIC MACHINERY DIVISION of Curtis Manufacturing Company
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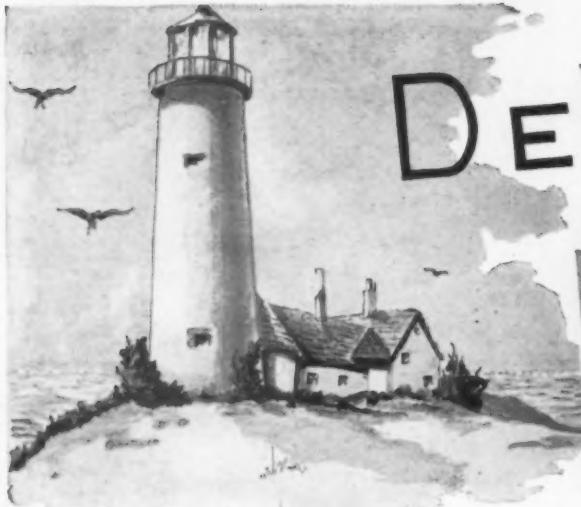
H-594

Name.....

Firm.....

Address.....

City..... Zone..... State.....



DEPENDABLE

to safeguard
flow control services
in all industries



Fig. 500—125-pound Bronze Gate Valve with screwed ends, screwed-in bonnet, inside screw rising stem and taper wedge disc; solid in sizes $\frac{1}{4}$ " to $\frac{3}{4}$ "; double in sizes 1" to 3".

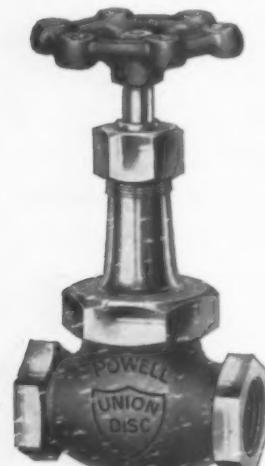


Fig. 150—150-pound Bronze Globe Valve with screwed ends, union bonnet and renewable composition disc.



Fig. 1793—Large 125-pound Iron Body Bronze Mounted Gate Valve. Made in sizes 2" to 30", inclusive. Has outside screw rising stem, bolted flanged yoke and tapered solid wedge. Also available in All Iron for process lines.

Just as mariners depend on lighthouses to safeguard their ships, so the men of industry depend on their flow control equipment to safeguard their manufacturing plants from "going on the rocks" of costly shut-downs.

With a background of more than a century of making valves—and valves only—Powell Engineers know how to make a valve dependable.

And because the Powell Line is so complete, there are Powell Valves—in Bronze, Iron, Steel, and the widest range of Corrosion-resistant materials ever used in making valves—specifically designed and made to give long, dependable performance in each and every flow control service known today.

It pays to consult Powell Engineers on all your requirements for flow control equipment.



Fig. 578—125-pound Bronze Swing Check Valve with screwed ends, screwed-in cap, and regrindable, renewable disc. Disc has ample lift to permit full unobstructed flow through valve body.



Fig. 241—Large 125-pound Iron Body Bronze Mounted Globe Valve. Made in sizes 2" to 16", inclusive. Has outside screw rising stem, bolted flanged yoke and regrindable, renewable bronze seat and disc. Also available in All Iron.

The Wm. Powell Company
Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES

Grind Faster... Grind Cooler
Grind Longer... Grind for Less

with

32 ALUNDUM[®] GRINDING WHEELS

Yes, you can
grind for less with
32 ALUNDUM wheels.

Why? — **Because**
32 ALUNDUM abrasive is
entirely different from any other
abrasive — made differently by
a unique Norton process which
you'll find described on the
other side of this page.



NORTON ABRASIVES

Here's why you can grind for less

with the Sensational 32 ALUNDUM Grinding Wheels

By an ingenious Norton-developed and patented process the grains of 32 ALUNDUM abrasive form in the electric furnace in a fluid matrix. This allows each grain to grow into a single, complete crystal—strong in shape and with many sharp points on all sides. Result: a faster and cooler cutting action.

And the matrix serves a dual purpose for it also absorbs the impurities present in the melt. Thus 32 ALUNDUM abrasive is over 99% pure fused alumina—more actual cutting material than in any other abrasive. Result: less dressing, longer wheel life.

By a complicated chemical process the matrix is dissolved away and the released grains are then washed and screened to size. No crushing is necessary.

That this sharper, purer abrasive really cuts grinding costs is being demonstrated every day in thousands of plants.

Are you taking advantage of 32 ALUNDUM grinding wheels?



A Demonstration

Here you see 32 ALUNDUM abrasive as it comes from the electric furnace—the individual crystals imbedded in the matrix in which they "grow." As this matrix is dissolved the grains are released—ready for screening to size.

See It Yourself

You'll find this demonstration and many more in the new Norton motion picture on 32 ALUNDUM abrasive. Arrange for a showing of this 16mm. Kodachrome sound film in your plant—no obligation.

NORTON ABRASIVES

NORTON COMPANY, WORCESTER, MASS.

Use "32" for



TOOL GRINDING



SURFACE GRINDING



INTERNAL GRINDING



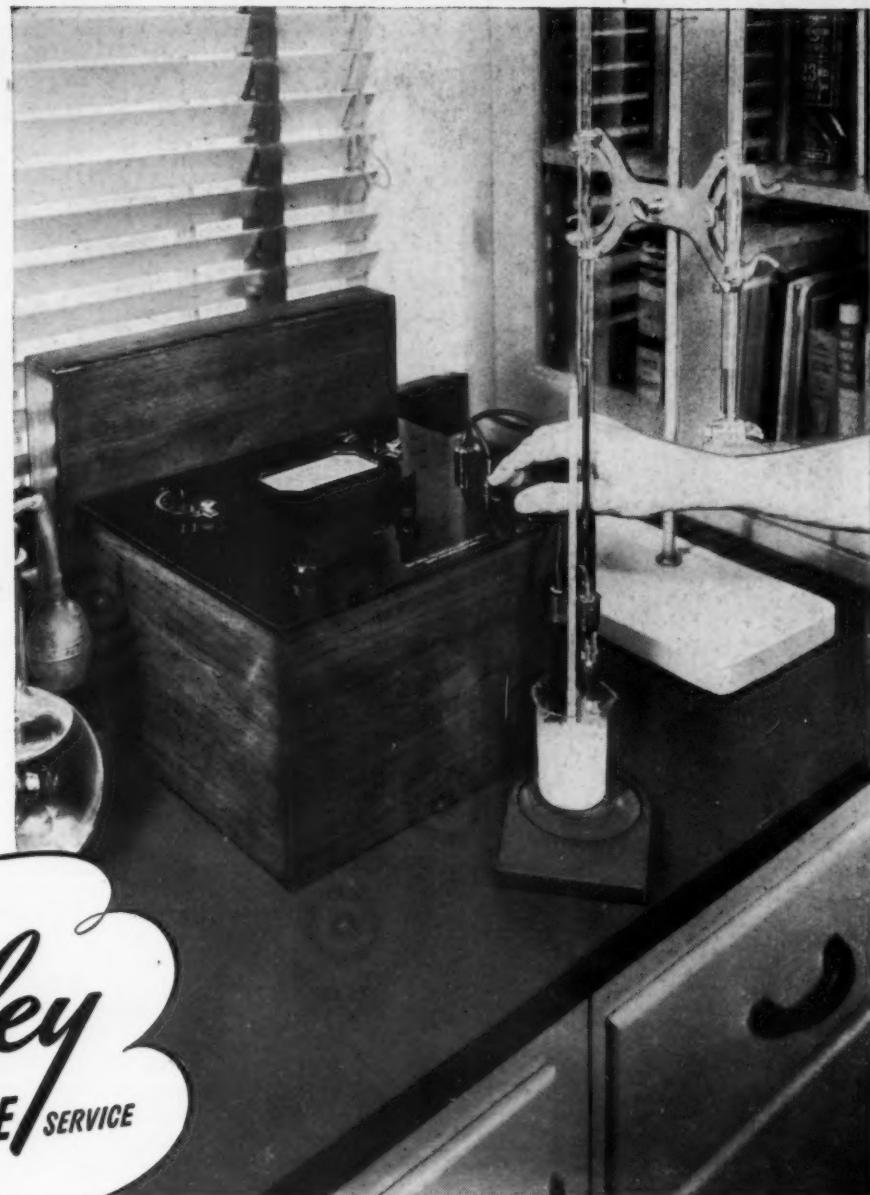
CYLINDRICAL GRINDING



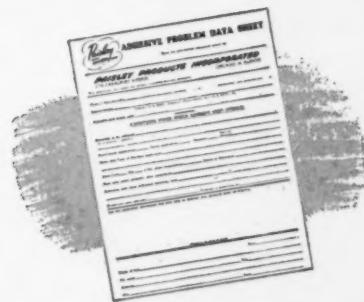
CENTERLESS GRINDING

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PURCHASING

The National Magazine of Industrial Procurement

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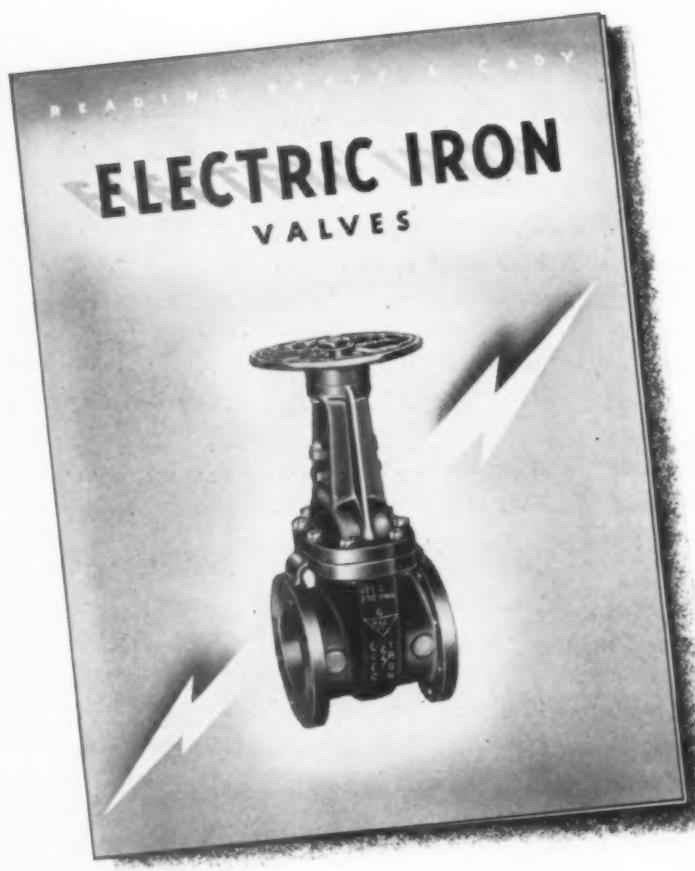
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BETTER IRON MAKES BETTER VALVES

AT READING-PRATT & CADY

There is one **BEST** method of melting and refining iron for valve castings. It is R-P&C's *Electric Furnace method*.

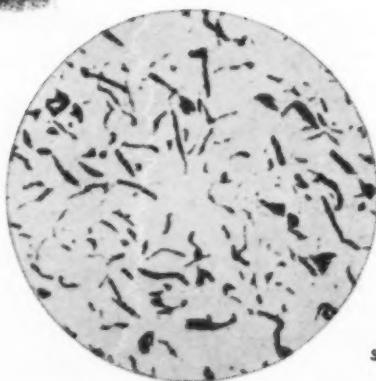


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Photomicrograph (enlarged 100 times) shows even distribution of fine graphite flakes. This contributes to the uniform structure of R-P&C Electric Iron.

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Industrial Geography

ELSEWHERE in this issue appears a map showing the location of steel-making capacity in the United States, which has suddenly become of vital importance to purchasing agents because of the change to f.o.b. mill pricing practice in that industry. The map shows very clearly the traditional concentration that has been characteristic of our industrial development. It also shows the beginning of a policy of decentralization that was stimulated by war necessity, and that is generally recognized as an economic boon even though its proportions, to date, in this particular industry, are not adequate to cope with the immediate crisis.

Contrary to popular opinion, and despite the obstacle of mounting capital costs for new construction, industrial surveys indicate that the trend toward greater geographical dispersion of producing facilities is no mere war phenomenon, but has been accelerating during the postwar years. Approximately one-half of present plant construction is in the South and West, which is about double the ratio prevailing ten years ago.

Yesterday's industrial maps are obsolete today. Today's maps will be obsolete tomorrow. Industrial migration and development are continuing processes. A great chemical industry has grown up in the Southwest. A major automotive center is in the making on the Pacific Coast. The Gold Rush of 1849 has its 1948 counterpart in the Iron Ore Rush to the northern Adirondack region of New York State, where one company alone has acquired nearly a quarter-million acres of mining property and others are not far behind. And purchasing agents attending the recent Salt Lake City conference of District No. 1 were told of important developments planned for the Rocky Mountain area.

Along with his manifold other responsibilities, the purchasing agent—responsible for the supply of raw materials and manufactured products—must become a student and an expert in the constantly changing field of industrial geography. The map in this issue is symbolic of a phase of procurement knowledge that is growing more important every day.

Stuart F. Henrity



No Steaming Needed

—in spite of 21 days of rugged winter!

Columbia Caustic Soda Tank Car Unloaded Without Difficulty

On January 28, 1948, a Columbia Caustic Soda tank car left Barberton, Ohio, consigned to a Massachusetts plant. Heavy snow storms side-tracked the car near Buffalo. Transit time for this haul, ordinarily three to four days, stretched out to twenty-one days.

In spite of the long exposure to sub-zero weather, the temperature of the caustic liquor, loaded at 150°F., dropped only to 95°F. None of the liquor had solidified and the car was unloaded easily and completely, without steaming.

Delays of this duration are rare. The incident therefore provides unusual evidence of the highly efficient design and construction of these cars—particularly in respect to insulation—and the rigid inspection and attention given to loading temperatures.

The same care is used in the manufacture and shipping of all Columbia products. Pittsburgh Plate Glass Company, Columbia Chemical Division, Fifth Avenue at Bellefield, Pittsburgh 13, Pennsylvania.

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IGHLIGHTS

A brief summary of outstanding features of timely interest and importance in this issue, to conserve the time of busy readers



Steel Sales are Now F.O.B. Mill. With the elimination of the basing point system by the steel industry, purchasing agents have found, as predicted by one of the leaders in the industry, that such a course is being followed by "a whole chain of painful complications." The article on page 92 is accompanied by a map showing the location of the country's steel production capacity and a tabulation which gives the actual capacity at the respective plants, though as pointed out these do not necessarily represent a source of supply.

How the Perfection Stove Company Buys: Commencing on page 102 is a description of **Budget System Purchasing**, featured by close collaboration between Sales, Production Control, Material Control and the Purchasing Department. It tells how the yearly sales budget is translated into a manufacturing budget and that in turn to a purchase budget for the purpose of smoothing out the production curve and to keep the working force active with minimum investment in balanced inventories. The whole cooperative procedure is described from the making of a master model to disposal of obsolete or surplus materials—with forms.

Shipping damage to freight is now in the astronomical bracket class—\$120,000,000 a year. And, this tremendous figure does not include the costs for handling claims, repackaging and miscellaneous labor and plant costs. As pointed out in the article on **Prevention of Loss and Damage Claims** (page 116) the purchasing agent is in strategic position to help offset the loss and inconvenience incident to lost and damaged freight by demanding that shipping practices be improved. He may even find it worth while to blueprint incoming shipments showing how materials are to be loaded and protected to facilitate handling at his plant and to obviate damage enroute.

A review of the general commodity and business situation based on the latest statistics and market reports appears in **Where We Stand** (page 123).

If you are buying **Die Castings**, you will find the article on page 129 of interest for it will give you an insight into the modern method of estimating costs, which takes into account the various advantages and limitations of the die casting process. Tables break down costs and give quantity costs.

Following the Order, or tracing, or expediting, or checking up on vendors' promises may seem quite elementary to the average purchasing agent, who obviously is concerned that ordered material arrives on required dates. Yet, there are many factors to be considered whether stock or ordered materials are involved. These are outlined in the article on page 95 which, among other things, stresses the importance of maintaining the good will of dependable suppliers.



Insulation to keep heat in or to keep cold out is an old subject. In industrial circles it represents a profitable investment that deserves the attention of the P. A. The article on page 136 on **What the Purchaser Should Know About Heat Insulation** tells about different kinds of insulation and their uses, their application, and about general handling and storage. The information therein should enable the purchasing department to cooperate on a practical basis with the using department and sales engineers.

The three national political parties recently adopted platforms that contain important and widely varying proposals concerning American business. This month's **Purchasing Opinion** (page 97) offers a summary of how purchasing agents regard these platforms and which of the planks they think will be integrated in the political economy within the next decade.



World Economic Recovery and its goal of increased productivity and better living standards for everyone everywhere with the implied assurance of **Good Times Ahead** is the subject of the article on page 120. The author stresses the need for capital to accomplish this potential but also emphasizes equal need for leadership, courage, and cooperation.

Contract Law Suits and Pitfalls and How to Avoid Them. That is the theme of Leo T. Parker's lesson on the simple facts of contract law on page 144. It is pointed out that all contracts are void which do not conform with state and United States laws. And, there is also the warning that payment for merchandise that is not correctly described in a contract of sale may be a total loss.

Trade Bulletins and Catalogs: Make a selection for your catalog file from the 106 listings in the "Ask Purch" Section (page 14)—they are yours for the asking—just use the prepaid post card. These and the many items in the **New Products and Ideas** section (page 150) will help you to keep abreast of new developments.

KEY FEATURES OF A COMPLETE STEEL SERVICE



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PLATES—sheared & U. M., Inland 4-Way Floor Plate, etc.
Sheets—hot & cold rolled, many types & coatings
TUBING—seamless & welded, mechanical & boiler tubes
STAINLESS—Allegheny metal sheets, plates, bars, tubes, pipe, etc.
REINFORCING—bars & accessories, wire mesh, etc.
BABBITT—and phenolic laminated bearing material
MACHINERY & TOOLS—metal working & boiler shop



Added Ryerson service includes a chart to guide heat treating sent with alloy shipments.

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Good Citizenship— a Business Responsibility

● By Joseph C. Andrews

ONE of the vivid impressions I have retained from Association work concerns our District Council Meeting of last spring. It was on a Saturday afternoon, balmy and warm, almost the first real spring day after a long, hard winter. Boston Common never looked more attractive. The feathery new leaves on the trees, the garden beds of bright spring flowers, invited relaxation out of doors, or a ball game, or golf—just about anything other than a long afternoon spent indoors reviewing the activities of the Association in the District and their coordination with the National Association programs. Nevertheless our group of National Directors and local officers, gathered from all over New England, worked until five-thirty on an agenda filled with reports and discussions vital to the growth and development of our Association.

This intense interest and loyalty to a cause developed another thought as I later recalled the busy, crowded hours of that afternoon. Are we as individuals contributing in the same way as useful citizens in our own respective home communities? Leadership and workers for community interests are so badly needed—help for the Community Chest, the Red Cross, all social agencies, our local and state government commissions, our hospitals and our churches.

The purchasing agent is a good business man. His knowledge and understanding of materials and commodities, his contacts and experience in dealing with people and personali-

(Please turn to page 334)

Joseph C. Andrews is Vice President and Director of Purchasing for the American Hardware Corporation, New Britain, Conn., having come up through the ranks in the course of a long and mutually pleasant business relationship. He has been in purchasing work since 1921, an active member of the Connecticut Purchasing Agents Association, and recently completed a year of service on the N.A.P.A. Executive Committee as Vice President for District No. 9, which comprises the four Associations in New England.

A couple of years after his graduation from Cornell University as a chemical engineer, Mr. Andrews returned to his native city of New Britain to establish the research laboratory for American Hardware, and to direct this new company activity. That job was interrupted by World War I, in which he served as Captain in the Ordnance Department, U. S. Army. Postwar, he acquired two years of valuable production experience in the finishing department of the Scovill Manufacturing Company in nearby Waterbury. In 1921, his former employers invited him to return as Assistant Purchasing Agent. Ten years later he was named Purchasing Agent and took on the additional responsibilities of Assistant Secretary of the Corporation. His appointment as Vice President followed in 1940, with general supervision over the purchasing activities of American Hardware and its affiliated companies, which include such well known and highly respected names as P. & F. Corbin, Corbin Cabinet Lock Company, Corbin Screw Corporation, and the Russell & Erwin Manufacturing Company.

Along with his business responsibilities, Joe Andrews has been a good citizen, contributing generously of his time, effort, and business ability on behalf of New Britain's hospitals and other civic activities.



MAGNESIUM— A War Baby with a Future



Pure molten magnesium produced at the government-owned plant of Dominion Magnesium Company near Renfrew, Ontario.

By Phil Glanzer •

North American production of magnesium today is a hundred times greater than total world output ten years ago; wide variety of product applications gives promise of further rapid developments

THE average American's most familiar association with magnesium (if he does happen to recognize it as such) is in the brilliant pyrotechnic displays of traditional Fourth of July celebrations, when star-shells burst into a shower of many-colored lights, filling the night sky with a blinding white glare.

Soldiers in the late war remember it similarly in the floating star-shells over the skies, while fliers recognize its two-fold use in incendiary bombs, both as the light metal casing for the inflammable thermite mixture, and as an ingredient of this mixture, for magnesium as a powder burns with terrific glare and heat.

In the late war, however, the emphasis was placed upon the use of magnesium, not as a powder, but as a structural metal in the production of airplane parts. Magnesium's extremely light weight, combined with strength, made it the ace of the light metals now in general use. Almost as light as wood, and 40% lighter than aluminum, magnesium provided the most rigid structure with the lowest weight of any metal.

It is possible, therefore, to build bigger planes by utilizing 40% larger magnesium castings, without a corresponding prohibitive increase in weight.

In the Light Metal Age now in

existence, metallic magnesium is being used for portable machine tools, farm machinery, and such things as typewriters, step-ladders, bicycles, washing machines, refrigerators, kitchen ranges, and metal furniture of the light portable kind.

Telephones and radios may also employ the new metal, though here plastics will rank as potential rivals. In any case, extensive use of magnesium will depend upon its comparative cost in relation to such metals as aluminum, nickel-chrome steel, as well as plastics.

However, whatever is "cooking" in the Light Metal Age of the future, you can be sure that magnesium will

also be used in the kitchen too! At the moment there are approximately a half-million magnesium griddles in use in American homes and many more are being sold each day.

While the griddle is perhaps the only magnesium cooking utensil in general use today, plans are under way for manufacture of other types of magnesium cooking equipment—such as skillets, Dutch ovens, etc.

No deep cooking utensils have yet been constructed from magnesium, and its use is today confined to baking and frying, where it is doing for such purposes an excellent job indeed. While magnesium as a metal can withstand the intense heat of a blow-torch without changing, it is a fact that water boiled in it does absorb some of its chemical ingredients—and you'd get a fine dose of laxative salts! However, the amount produced in a single cooking operation would be almost infinitesimal. There are, however, some high purity magnesium alloys which have recently been developed and patented by The Dow Chemical Company which do not exhibit this reaction.

The use of magnesium alloys for cooking utensils, however, is still in the developmental stage and it is impossible to predict what the development of new alloys or new treatments may make possible in this field. The use of magnesium in the first cooking utensils to be developed commercially, namely the griddle, has been outstandingly successful. Producers of the metal are doing considerable experimental work looking toward the development of further applications of this type.

One is reminded of the controversies relative to the respective merits and disadvantages of aluminum and granite-ware utensils when aluminum products were first offered to the public. Today the whole matter has been forgotten, and the use of aluminum in the construction of good cooking equipment is taken for granted. It is not unlikely that magnesium may have the same experience.

Meanwhile, Dr. Lloyd M. Pidgeon, a prominent Canadian physicist, has evolved a commercial process for extracting metallic magnesium from dolomite rock—and is employing it in the new \$3,000,000 government financed plant at Haleys, Ontario.

Today, due to the increased need for light metals, North America produces 100 times as much magnesium as the total world output in 1938. The Dominion Magnesium Limited Plant at Haleys, Ontario, is the first large-scale Canadian producer of magnesium from dolomite by the fer-

ro-silicon process, which Dr. Pidgeon developed in intensive research sponsored by the National Research Council in Canada. Production of the metal in the pilot laboratory, commenced as early as June 1941.

Actual processing or reduction of the ore begins when the ground dolomite goes into huge rotating kilns, great steel tubes, lined with brick, 120 feet long and 8 feet in diameter (high enough for a man to stand upright in). Here, one-half the weight of the dolomite is driven off in the form of carbon dioxide under heat and pressure, and the 50% residue of calcined rock (in powder form) is now 24% magnesium.

Mixed at this stage with ground ferro-silicon and pressed into small briquets, these are preheated, then go into nickel-chrome steel retorts,

resembling huge test tubes.

Kept in these retorts for eight hours under a vacuum, at temperatures reaching 1,100 degrees Fahrenheit, the metal becomes a glowing incandescent mass, and the pure magnesium is driven off as a vapor.

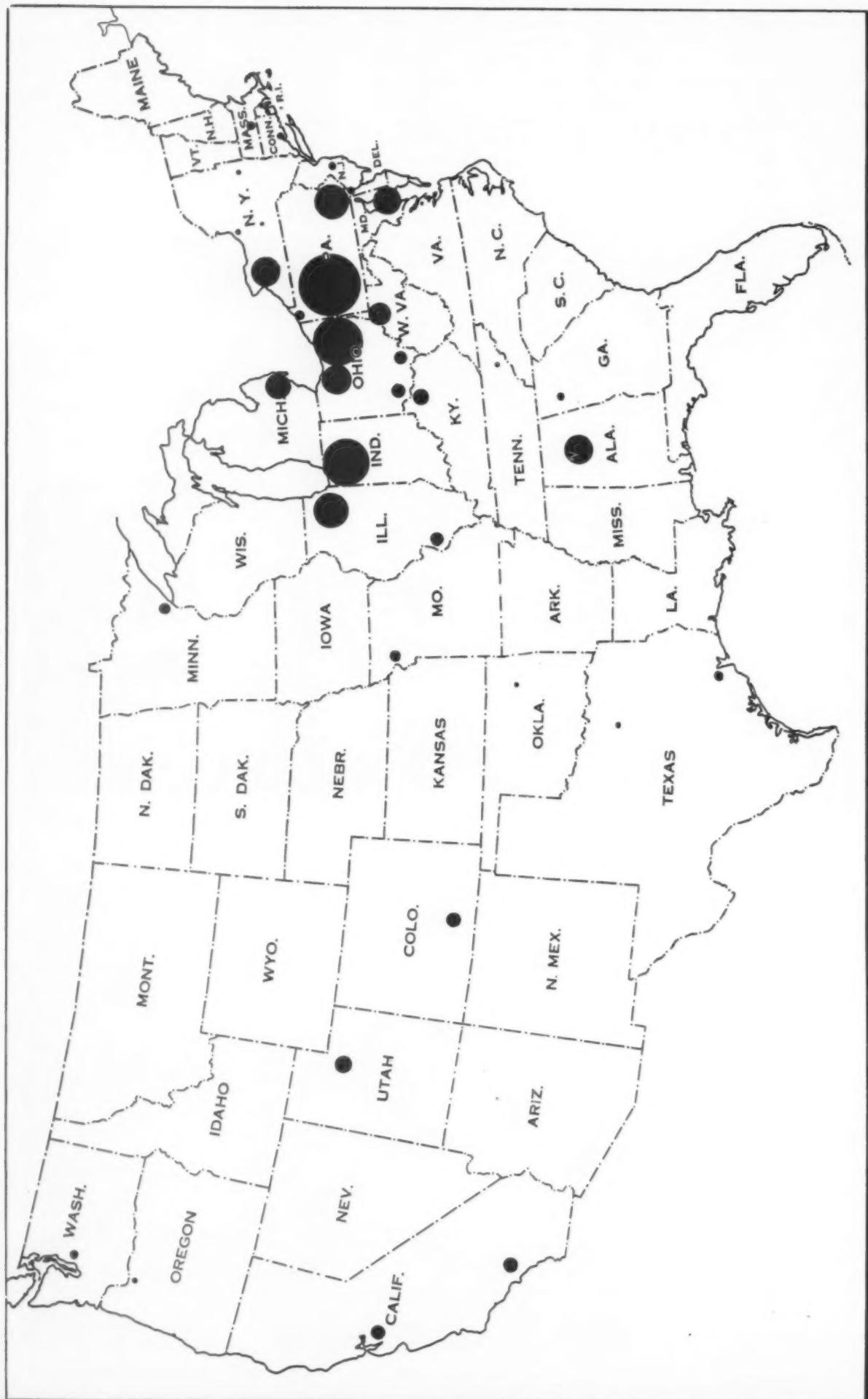
Each retort has a water-cooled sleeve, onto which the magnesium vapor is drawn, in order to cool slowly. As it cools it crystallizes like frost and the encrusted magnesium is now in the form of gleaming, silverlike crystals. These are chipped off, melted in round open furnaces under a protective flux to prevent the molten metal from taking fire, then poured into moulds to make the magnesium ingots. The process is safe; the magnesium while still in vapor form never comes in contact with the air or any inflammable gases.



Light weight, combined with strength, is characteristic of magnesium products; a 16 1/2 ft. canoe weighs only 59 pounds.



The highly successful and efficient magnesium griddle may be the forerunner of a complete line of kitchen utensils.



SHOPPER'S GUIDE TO THE CASH-AND-CARRY STEEL MARKET

Two-thirds of the total national production of steel is concentrated in two relatively small areas adjacent to Pittsburgh and Chicago. For thousands of buyers located at a distance from these centers and having steel requirements beyond the capacity existing in other parts of the country, steel purchases now involve a long and expensive haul. It is more than ever essential for the purchasing agent to know the closest available source for his steel needs. A detailed map in full color, identifying all individual plants by location, ownership, capacity, and type of furnace, can be obtained upon request to the Iron and Steel Section, Office of Domestic Commerce, U. S. Department of Commerce, Washington, D. C.

Steel Sales are Now f.o.b. Mill

MOST sensational development in third quarter steel transactions, more significant than changes in the prices themselves, has been the change-over from traditional basing point pricing to sales on an f.o.b. mill basis. The new policy, announced early in July by leading producers, was not altogether unexpected. It followed the Supreme Court decision condemning the basing point system in the cement industry, with similar action pending against the steel industry, aimed at curbing alleged monopolistic practices traced to the pricing system. Commenting on this possibility, in an address at the N.A.P.A. convention on June 1st, Hiland C. Batcheller, President of Allegheny Ludlum Steel Corporation, predicted that a whole chain of painful complications would ensue, characterizing the situation as "anarchy in selling".

Federal Trade Commission spokesmen are reported as saying that some

intermediate policy might have been adopted, since the Supreme Court decision does not prohibit freight absorption to "meet competition", and have indicated that FTC would be receptive to a consent decree under which freight absorption would be permitted under certain stipulated conditions. The industry, however, is wary of any agreement that would leave them vulnerable to court action, and may press for legislation that specifically legalizes freight absorption by manufacturers quoting f.o.b. mill prices.

Meanwhile, the plain fact of the matter is that since the monopolistic aspect of "fixed prices" has been eliminated, steel users located distantly from their sources of supply, may have to pay up to \$12 per ton more than their more fortunately located competitors.

The accompanying map, based on Department of Commerce figures for 1947, shows the location of steel pro-

duction capacity throughout the country—heavily concentrated in the Pittsburgh - West Virginia - Eastern Ohio district (43%) and in northern Illinois-Indiana (20%), with the rest of the facilities scattered in smaller units throughout twenty-one states. The details are set forth in the tabulation which follows. It should be noted that all of the capacity here listed does not represent a potential source of supply for the steel buyer. About 25% of the Michigan total, for instance, consists of the Ford Motor Company's steel mill output, and this will be closer to 30% with the completion of expanded facilities this year; and Ford is a buyer—not a seller—of steel. Many of the other units listed are in the same category.

Here, then, is where the steel buyer must shop for his supplies on the new "cash and carry" basis—and the "carry" is likely to prove one of the biggest headaches that industrial purchasing has known for many years.

STEEL PRODUCTION CAPACITY IN THE UNITED STATES

		Open	Besse-	Elec-	
		Hearth	mer	tric	
ALABAMA					
Anniston	Kilby Steel Co.	54	20		
Birmingham	Connors Steel Co.		60		
Ensley	U. S. Steel Corp.	1,568			
Fairfield	U. S. Steel Corp.	1,282			
Gadsden	Republic Steel Corp.	650			
CALIFORNIA					
Fontana	Kaiser Co., Inc.	720	30		
Los Angeles	Bethlehem Steel Corp.	117			
Niles	Pacific States Steel Corp.		83		
Oakland	Judson Steel Corp.	77			
Pittsburgh	U. S. Steel Corp.	354	9		
South	Bethlehem Steel Corp.	235			
San Francisco					
Torrance	National Supply Co.		46		
Torrance	U. S. Steel Corp.	202	6		
COLORADO					
Pueblo	Armco Steel Corp.		1,272		
CONNECTICUT					
	Bridgeport		Stanley Works		188
DELAWARE					
	Claymont		Werth Steel Co.		460
GEORGIA					
	Atlanta		Atlantic Steel Co.		154
ILLINOIS					
	Alton		Laclede Steel Co.		326
	Chicago Heights		American Locomotive Co.		78
	Chicago Heights		Columbia Tool & Steel Co.		7
	Granite City		Granite City Steel Co.		500
	Peoria		Keystone Steel & Wire Co.		302
	South Chicago		Republic Steel Corp.		1,000
	South Chicago		U. S. Steel Corp.		3,755
	South Chicago		Wisconsin Steel Co.		500
INDIANA					
	East Chicago		Reconstruction Finance Corp.		120
	East Chicago		Youngstown Sheet & Tube Co.		330

		Open Hearth	Besse- mer	Elec- tric		Open Hearth	Besse- mer	Elec- tric
Fort Wayne	Joslyn Mfg. & Supply Co.			38				
Gary	U. S. Steel Corp.	5,719					75	75
Indiana Harbor	Inland Steel Co.	3,400					50	50
Kokomo	Continental Steel Corp.	364					2,345	158
New Castle	Ingersoll Steel & Disc. Div.			24			260	135
KENTUCKY								
Ashland	Armco Steel Corp.	795					1,753	
Newport	Newport Rolling Mill	413						21
MARYLAND								
Baltimore	Armco Steel Corp.			95				
Sparrows Point	Bethlehem Steel Corp.	3,835	240					
MASSACHUSETTS								
Worcester	U. S. Steel Corp.	250						
MICHIGAN								
Dearborn	Ford Motor Co.	770		45				
Detroit	National Steel Corp.	2,050						
Detroit	Rotary Electric Steel Co.			255				
Ferndale	Allegheny Ludlum Steel Corp.			3				
MINNESOTA								
Duluth	U. S. Steel Corp.	610						
MISSOURI								
Kansas City	Armco Steel Corp.	426						
NEW JERSEY								
Harrison	Crucible Steel Co.			5				
Roebling	John A. Roebling's Sons Co.	253						
NEW YORK								
Buffalo	Allegheny Ludlum Steel Corp.			4				
Buffalo	Republic Steel Corp.	830						
Cortland	Wickwire Bros.	38						
Dunkirk	Allegheny Ludlum Steel Corp.			33				
Lackawanna	Bethlehem Steel Corp.	3,120						
Lockport	Simonds Saw & Steel Co.			22				
Syracuse	Crucible Steel Co.			54				
Tonawanda	Colorado Fuel & Iron Co.	180						
Watervliet	Allegheny Ludlum Steel Corp.			25				
OHIO								
Campbell	Youngstown Sheet & Tube Co.	1,212	240					
Canton	Barium Steel & Forge Co.	50						
Canton	Reconstruction Finance Corp.			360				
Canton	Republic Steel Corp.	240		510				
Canton	Timken Roller Bearing Co.	202		345				
Cleveland	Bethlehem Steel Corp.	840						
Cleveland	Republic Steel Corp.	1,500						
Lorain	U. S. Steel Corp.	1,326	558					
Lowellville	Sharon Steel Corp.	600		36				
Mansfield	Empire Steel Corp.	276						
Massillon	Republic Steel Corp.	610						
Middletown	Armco Steel Corp.	894		54				
Portsmouth	Portsmouth Steel Corp.	756						
Steubenville	Wheeling Steel Corp.	1,008						
Toronto	Follansbee Steel Corp.	126						
Warren	Copperweld Steel Co.			404				
Warren	Republic Steel Corp.	860						
Youngstown	Republic Steel Corp.	1,450	700					
Youngstown	U. S. Steel Corp.	1,560	784					
Youngstown	Youngstown Sheet & Tube Co.	1,104						
OKLAHOMA								
Sand Springs	Armco Steel Corp.		54					
OREGON								
Portland	Oregon Steel Mills			60				
PENNSYLVANIA								
Aliquippa	Bethlehem Steel Corp.	1,182	582					
Aliquippa	Vulcan Crucible Steel Co.			10				
WEST VIRGINIA								
Benwood	Wheeling Steel Corp.							
Weirton	National Steel Corp.							

Following the Order

The purpose behind "following the order" of course is to see that the ordered material arrives at the plant on the dates requested or as near them as possible.



By F. J. Schweiss •

Aside from such basic factors as production requirements, production schedules, the dictates of warehouse minima, and a knowledge of supply conditions and delivery habits of suppliers, noblesse oblige plays an important role in follow-up work to get delivery based on stated needs and suppliers' promises

WHEN an order is entered it is always wise to show on its face the time or date the material is desired and required in the plant. There are two factors that will decide when this date should be. The material will either be for stock, or immediate production, and in both cases if any company is to make plans or be able to keep delivery promises on production of goods it must either have the raw materials or other needed production and assembly essentials, either in the plant as stock, or feel sure they can count on their arrival on the dates for which production schedules make delivery imminent. Seeing that material arrives on required dates is the value of following the order.

Just putting any date on the order is not good enough. There is no value in it, except having material in the plant, which is often not practical because of small storage facilities. The one factor which should dictate the date needed are the storeroom records. If they are watched so that a maximum and minimum quantity is determined based on past performance records of use, it is only necessary to order when stock is depleted to the minimum quantity, and then only enough additional to attain the maximum figure. The date the material would be needed would only be the length of time so many days hence, which past results have shown the minimum quantity was reached.

The kind of business being op-

erated makes a difference. If all production materials are taken from stock, then storeroom records would be the only factor, unless unforeseen production problems occur, that will determine the required material date. In establishing maximum and minimum quantities, however, in the stock list, the length of time it requires suppliers to make shipment should be an important element in figuring the time to replenish the stock. It is well to indicate the date on the order on which the material is needed, but that date should be in accordance with the necessary time it takes to secure the material.

It is much easier to follow orders and keep production schedules up to date if the material requirements are

Putting any date on an order is not good enough.

In establishing maximum and minimum quantities, suppliers' delivery time is an important element in figuring time to replenish the stock.

The secret of following the order successfully is having the correct date on the order in the beginning.

In following the order it is important to see that the supplier keeps his promise rather than nettle him constantly about a better delivery.

reckoned on supply possibility. For instance it takes a certain length of time to make grinding wheels; they have to bake in the kiln a while, turning takes allotted time, trueing, testing, etc., and it is foolishness to expect them any faster than it is possible to make them. For this reason stock records should be so constructed that wheels can be available for production at all times by ordering in time.

If very little stock is carried, because of the type of business, or its policy, and material is ordered only to fit production requirements, then the second factor influencing the required date is the production schedule. In these cases the date needed should be in accordance with the time required to make the product. After a business has been in lengthy operation, this time element of material supply is taken into consideration, and production will run smoothly because of timed supply, since the needed material is made under the same conditions by the vending companies.

The Follow-Up

Following the order is necessary. It is nothing more than seeing that ordered material arrives at the plant on the dates requested, or as near them as possible. The secret of following the order successfully is having the correct date on the order in the beginning. There is no advantage in making things difficult. If any deliveries can be improved, all well and good, and if permanent advantage through delivery improvement is devised, fine; but expressing a date needed, and then hounding the supplier for the goods before that date is not good method because it destroys future amicable order delivery.

Establishing a reputation for being particular and exact is important, but do so in the quality of the goods, and not in harassing a supplier. Ven-

dors will send acknowledgments of orders placed, and will give shipping promises. These promises should be in accordance with past deliveries and will be a means of gauging future shipments. In following the order it is important to see that the supplier keeps his promise rather than nettle him constantly about a better delivery.

Early deliveries should be discussed when the order is placed, and when a promise is made it is the promise that should be followed. It is very easy to trace a supplier's past performance relating to delivery, and those who keep their promises need not be followed too closely. A reputation for keeping one's word is a very desirable quality, and those vendors who possess it should be cultivated since they allow the company to plan production schedules with accuracy.

The best method following orders is to use the material request forms, from which the orders were placed, as tracers, and to file them daily in a tickler file for those days of the

month sufficiently ahead of the promised or desired delivery date of the order, for reference on that day. For each day, the tracer file will be gone over, and depending on what delivery information has been received or given—which for convenience and ease should be marked on the purchasing department's copy of the order—any necessary steps should be taken.

These tracers will act only as a means of bringing the purchasing agent's attention to the order at the proper time. In addition, these material request forms have the added advantage of aiding in keeping any correspondence on any subject order in one file. The correspondence and request can be clipped together, and will present the whole story in one sheaf.

If a purchasing agent knows his suppliers well enough, and retains a record of their performance in his mind, he need not contact a great quantity of suppliers every day about material that is to be received. His tickler file should call to his attention every day the condition of each individual order, and in those cases where a telephone call is necessary or will suffice, this should be done. In other instances, where the supplier's establishment is some distance away, or correspondence is necessary, a letter should be the means of requesting information.

Stock Form Tracers

It is the practice of many large companies to use printed stock forms, called tracers, for those occasions when timely delivery seems in doubt.

(Please turn to page 332)

Seeing that material arrives on required dates is the value of following the order. Early deliveries should be discussed when the order is placed and promises should be followed.



How Do The PARTY PLATFORMS Look to Business?

As election day nears, American business men are attaching increasing significance to the attitudes of the leading political parties toward present day economic problems, as expressed in their party platforms. In our survey this month, purchasing agents in all parts of the country indicate (1) their choice of planks to meet particular problems, and (2) their opinion as to what planks represent a trend in the country. Sources of the statements below, not identified in the mailed questionnaire, are shown by (R) for Republican, (D) for Democratic, and (P) for Progressive party platforms.

FREE ENTERPRISE SYSTEM

Reaffirm the principle of competition as a means of furnishing opportunity for youth and for all enterprising citizens, increasing productive power for national defense, economic well-being, and political freedom (R)

Support the right of all people to work together in any proper business operations, free from any arbitrary or discriminatory restrictions (D)

Establish economic planning, with public ownership of banks, railroads, electric and gas utilities, and industries primarily dependent on government funds or government purchases (P)

Which plank, in your opinion, offers the best immediate solution to the problem?

91%

31%

0%

Which plank do you think will become law or general practice in the next decade?

50%

35%

16%

MONOPOLY

Aggressive anti-monopoly action to encourage small business (R)

Strengthen existing anti-trust laws to prevent concentration of economic power (D)

Public ownership of key areas of the economy since legislation and regulation are not sufficient (P)

46%

54%

0%

37%

50%

13%

INFLATION

Progressive reduction of the cost of government (R)

Stimulation of production (R)

Fiscal and tax policies to provide increased incentives for production and thrift (R)

Sound currency; reduction of public debt (D)

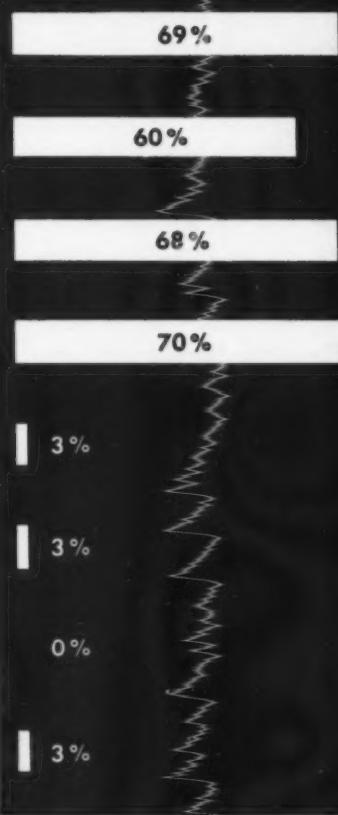
Price controls to reduce and keep down the prices of living essentials and basic materials (P)

Limitation on business profits (P)

Subsidies to maintain fair agricultural prices (P)

Allocation of materials and goods in short supply (P)

Which plank, in your opinion, offers the best immediate solution to the problem?



Which plank do you think will become law or general practice in the next decade?

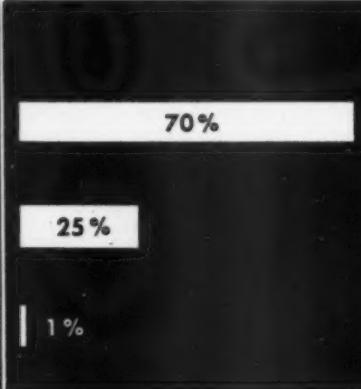


LABOR

Continuing study to improve labor-management legislation in the light of experience and changing attitudes (R)

Repeal of the Taft-Hartley Act. Minimum wage of 75¢ an hour (D)

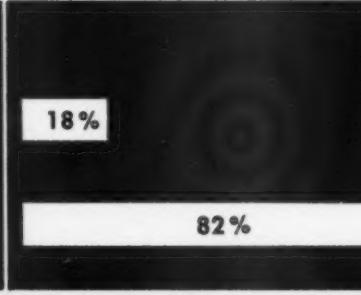
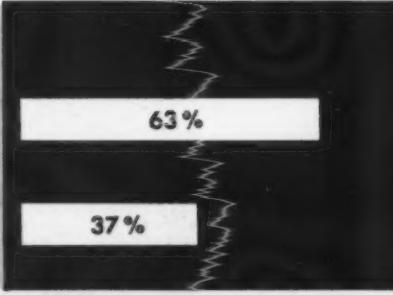
Repeal of the Taft-Hartley Act. Minimum wage of \$1 an hour (P)



NATURAL RESOURCES

Restore to the states their historic rights to the tide and submerged lands (R)

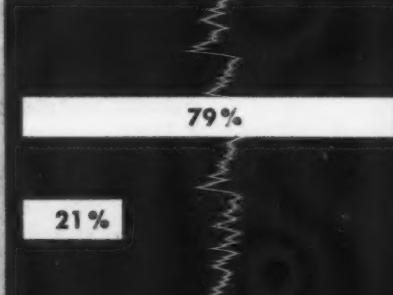
Federal control of tideland oil resources, since they belong to all the people (P)



FOREIGN TRADE

Support of the reciprocal trade system, safeguarding our own industry and agriculture (R)

Restoration of the reciprocal trade agreements program formulated in 1934 (D)



The Purchasing Agent and His Functions

• By A. L. Graveline

Purchasing Agent
Bulldog Electric Products Co., Detroit

The essence of all purchasing department functions is service

CONTRARY to what is generally believed by some people, the Purchasing Agent's job is not a "bed of roses", nor is it one continuous round of good times attending football games, hockey games, or playing golf. In fact, the job of buying is particularly tough these hectic days, and due to extreme shortages of materials—principally steel—there are many headaches involved.

The large percentage of the manufacturer's dollar spent for purchased materials, parts and supplies generally spells out the importance of the Purchasing Department in the company organization, and broadly defines the duties and responsibilities of the purchasing personnel. It is the Purchasing Agent's job to organize his department so as to render the utmost service to all other departments in the organization, and it is his responsibility, in order to keep production lines running and to meet the schedules of delivery required by the Sales Department, to purchase the right materials, in the right quantities, at the right price, and to arrange for their delivery to the right place, and at the right time. It is also his responsibility to select the right vendors for various commodities so as to assure quality material with uninterrupted flow of delivery, and furthermore, the Purchasing Agent has to maintain at all times good vendor relationships with all suppliers.

It is also necessary that the Purchasing Agent, or his assistants, courteously interview all visiting salesmen and properly screen all commodities or material offered by such salesmen, so as to determine if the materials offered are desirable for present production or future requirements. This necessitates the closest

cooperation with the Production Department, Engineering Department, and Research Department, so as to supply Production's constant needs and to bring to the attention of the Engineering and Research Departments any new items or materials which might possibly be utilized in present production or used in future design or development.

The wise Purchasing Agent will keep in mind that the salesmen calling upon him are entitled to all possible courtesy, and realizes that the salesmen are trying to do a good job of selling for their companies, the same as he—the Purchasing Agent—is trying to do a good job of buying for his company. Also, the alert buyer knows that salesmen are his best source of information.

In addition to buying all materials and services required by his company for production and maintenance, and being responsible for these until they are furnished to the consuming department, the Purchasing Agent has also to investigate continually possible new sources of supply, and to follow business conditions closely as well as markets. It is also the duty of the Purchasing Department to dispose of all surplus or obsolete materials at the most opportune time to the best possible advantage.

The Purchasing Department has also to work in close cooperation with the Receiving and Inspection Departments and often goes beyond their normal responsibilities to assist and see that materials are delivered promptly to stock or consuming departments after receipt, and has also to arrange for prompt replacement of incorrect or unsatisfactory materials rejected by the Inspection Department, properly ad-

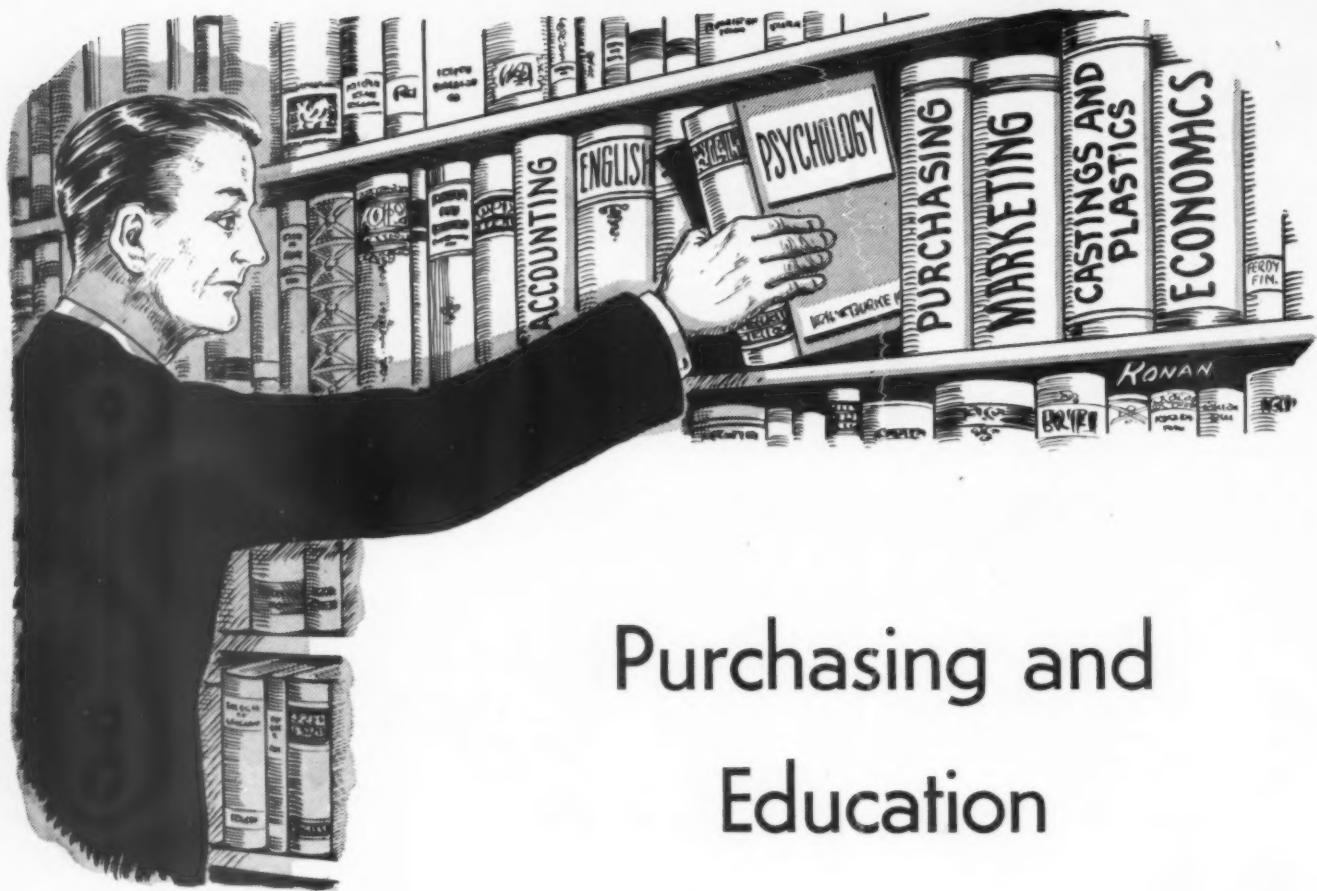


Mr. Graveline's article, which first appeared in his company's house organ, "Bulldog Barks", is a basic interpretation of the purchasing job for the benefit of those within the organization who use Purchasing Department services and those among outside suppliers who call upon the department to sell their products.

justing all such matters with the greatest possible dispatch.

It is only through years of actual experience that the Purchasing Agent acquires the "know how" for efficient purchasing, and thus he is able to render service when and where required, to all departments.

The essence of all purchasing functions is service, and we are always glad to see the salesman with a product to sell and with a story to tell us about the product, for he is helping us to do our job the way we want to do it—responsibly.



Purchasing and Education

A generation of self-made purchasing agents is passing. Will their successors be able to equal or better their record?

By James M. Berry

Assistant Purchasing Agent
Vick Chemical Company
Greensboro, North Carolina

In the majority of cases, men entering the purchasing profession more than twenty years ago found little organization and few records to assist them. The fund of knowledge making up the present concept of scientific purchasing was acquired gradually and with difficulty. From small beginnings the National Association of Purchasing Agents, and the local associations comprising it, led in the development of professional standards. Nevertheless, prior to World War II the progress of purchasing was largely upon the basis of individual capabilities and performances.

War-induced shortages of materials brought management to a realization of the importance of purchasing. Industrial purchasing agents generally did an outstanding job

meeting the needs of the war effort and, with what was left, providing for civilian consumption. The final readjustment to the post-war economy may be expected to shift emphasis from purchasing to production and to sales. Purchasing agents cannot be complacent in the face of changing conditions or they will lose the gains of the war period. The hope of purchasing lies in the selection and training of new purchasing agents.

"Exercise of the Mind"

Education is the key to the future of purchasing, in a more complex, a

more confused, but a more closely related and interdependent world. The colleges and universities are enjoying greater enrollments than ever before. The purchasing agent of the future cannot hope to compete without a better-than-average college training. But a college degree is just the beginning. Education is a continuous, never-ending process of learning and thinking. As Socrates said, "Education is the exercise of the mind."

The background of formal education of a prospective purchasing agent should include a thorough understanding of Economics, Accounting,

English, and Psychology. A knowledge of pertinent engineering subjects, such as Mechanics, Chemistry, Physics, and/or Electronics would be desirable. The more general subjects, however, are of greater value because they provide the foundation for further learning, and are difficult to acquire after leaving the classroom. The technical subjects required can be mastered on the job, if the habit of exercising the mind has been developed.

The value of Economics is easily understood since the theory of business cycles, money markets, and the ramifications of international trade are put to use daily. Accounting develops accuracy and thoroughness, the power of analysis, and habits of orderly arrangement and presentation of facts. College English courses, with their volume of reading and writing, teach the student to read understandingly and to formulate and express his thoughts. Knowledge is of little value if it cannot be put into words that convey ideas and induce action in others.

Importance of Psychology

The study of Psychology prepares tomorrow's purchasing agent to understand human relationships in business. There is an increasing realization of the importance and dignity of the individual as a human being and as both the means and the end of all business activity. Within his own organization the effectiveness of the purchasing agent is increased by cordial and friendly associations with individuals in other departments. The sellers' markets of recent years have demonstrated the value of close personal contacts and the development of mutual respect and confidence with suppliers. Recognition of the importance of psychology in business is shown by the increased emphasis being given to personnel management and labor and public relations.

Specialized Training

With the background of a liberal education the future purchasing agent should have some training in coordinate functions of the business. An apprenticeship in production, marketing, or finance would be helpful. This is not always possible, but a brief orientation in shop, receiving, shipping, inspection, accounting, personnel, advertising, and sales departments can and should be included. The training in other departments

gives an understanding of overall company policies and of the position of the purchasing department in the organization. The time spent in various departments depends upon circumstances, as well as on the aptitude of the apprentice and plans for his subsequent assignment.

Similarly, the study of purchasing operations by apprentices and junior executives of other departments should be encouraged. The time devoted to explaining the purpose and scope of the purchasing function, and in demonstrating methods and procedure, would be well spent. A more sympathetic understanding of purchasing problems and closer cooperation could be expected to result from actual contact with purchasing operations.

General Practical Experience

On-the-job training in the purchasing department, itself, affords the best opportunity for the further education of the future purchasing agent. Observing the operations of purchasing routine, under the supervision and with the assistance of those immediately in charge, ties together and fixes an understanding of the purpose and functional operation of purchasing. Assisting in performing all manner of operations familiarizes the apprentice with the tools of purchasing and develops in him a respect for the day-to-day routine of carrying out the purchasing responsibility.

Frequent and periodic conferences are conducted for all buyers, as a means of developing and insuring uniform and co-ordinated execution of purchasing policies. Apprentices and clerks marked for advancement into buying jobs should be included whenever subjects under discussion will permit. Informal discussions reviewing and exchanging ideas freely on current purchasing problems, market developments, and special topics will broaden and increase the purchasing knowledge and judgment of both new and experienced purchasing personnel. No one is ever too old or too wise to learn, and ideas are encouraged in an atmosphere of open discussion.

Group Discussions

In practice it may be found wise to schedule in advance of each conference a subject, selected for its educational value for future purchasing agents. The assignment of a topic for preparation and presentation at one of the conferences will afford

the experienced purchasing man opportunity for review and stimulate new thinking on a familiar subject. The conferences should be informal gatherings, however, at which each member feels free to discuss procedural problems, market and economic information, or any subject of general purchasing interest. These informal topics should be given precedence over scheduled subjects if the greatest value is to be obtained by both experienced and prospective purchasing agents.

Exchange of Ideas

Discussions of important raw materials or controversial policy questions, such as reciprocity, speculative buying, and escalator clauses, are likely subjects for advance scheduling. A discussion of a specific raw material should be led by the buyer concerned with that commodity, and cover the characteristics of the commodity and its market, specifications desired and available, and methods and considerations of purchase and use. Practice in leading a discussion gives the buyer greater facility and confidence in counseling with other officials of the organization in presenting his recommendations concerned with the specifications, inventory accumulation, or other problem in connection with a commodity.

A Challenge and an Invitation

Case studies in purchasing policies and procedure are unfolding daily—if the purchasing agent will pause to analyze and discuss them with other members of his department. The illustration of the working out in actual situations of policies, specifications, and sources can be put across with all the suspended interest of serial melodramas. A discussion of the factors involved in a pending development, and consideration of possibilities and probabilities in advance, present a challenge to the most experienced purchasing agent and an invitation to learning to the future purchasing agent.

The science of purchasing has been developed and secured by the older, or self-made, purchasing agents. The profession has become recognized as a major function of business. With this heritage the young men entering purchasing must bring to the job liberal educations, alert and inquiring minds, and the desire to continue learning. With these qualifications and adequate training they can equal or better the record of their predecessors.

How Perfection Stove Company Controls Materials and Purchases

● **By Paul T. Skove**
Purchasing Agent
Perfection Stove Company
Cleveland, Ohio

Planning and coordination result in balanced procurement and manufacture of varied products

THE Perfection Stove Company manufactures 115 different models of oil and gas appliances and accessories, for cooking and for home heating. A number of these products are quite seasonal in nature. The management makes a determined and constant effort to level off production so as to smooth out the production curve. The company aims at a uniform flow of production to balance the man-power in the production plants.

In line with this objective, an important feature of the purchasing policy is a real attempt to get the closest possible information from the Sales Division as to any expected increases or decreases in demand, taking each product separately, and to keep the production departments supplied with the materials, purchased parts, and supplies they need to carry out the manufacturing schedule, without tying up too much money in inventories.

Perhaps the most important single factor in the procurement function is the painstaking method followed in learning the exact status of every item of raw material, purchased parts, and production and maintenance supplies, on the first day of each calendar year, then starting out as if just starting in business and operating each year on the basis of sales forecasts. This is implemented by means of a purchasing budget, broken down into the smallest units of requirements in full detail, and approved *in toto* by top management.



Paul T. Skove

Mr. Skove recently completed his 38th year with Perfection Stove Company, of which the past 16 years have been spent in purchasing. He is a native of Cleveland. His first business venture was the purchase of a newspaper route from M. J. Van Swearingen, later to become a well known railroad magnate, at a capital investment of \$1.50, showing early promise as a buyer. He went to work at the age of 14, but found time to complete a course in business administration at Fenn College. His first position with the Cleveland Foundry Company (predecessor to Perfection Stove Company) was as head of the Cost and Payroll Department. He has been Assistant Secretary of the company since 1917, became Purchasing Agent in 1932, and was elected to the Board of Directors in March, 1948. He is a past president and national director of the Cleveland Purchasing Agents Association, an active member of the Shaker Heights Post of the American Legion, the Garfield Perry Stamp Club, and the Canterbury Golf Club, and is Assistant Superintendent of one of the largest Sunday Schools in Ohio.

While taking a complete physical inventory at the beginning of each calendar year is a heavy task, requiring the expenditure of considerable time and money, it has been found advantageous to start each year with a clean slate. The first-of-the-year inventory is the rule, not only in the main plants, but in the branches throughout the entire organization. It also includes work in process and finished stock.

The sales forecast is made for the coming twelve months. At the beginning of each month, the sales for the next succeeding twelve months are projected according to the best information available. To put it briefly, the sales budget—for twelve twelve months at a time—is translated into a manufacturing budget, which in turn is translated into a purchasing budget. The main purpose is to avoid sudden changes in the production program, to keep the working force balanced, and to avoid layoffs.

At a stated time each month, and as often otherwise as may be deemed necessary, a coordinating committee gets together to review the latest forecasts on the sales of the various products, and these are checked against the previous production schedules. A Production Schedule is usually a 12-month projection of what we are going to make, including all the individual models and based on what the sales demand for

each model is likely to be.

The committee is representative, with members from the Administrative, Sales, Production Control, Material Control, and Purchasing Departments. The idea is to rebuild the projected Production Schedule in accordance with the latest information. The recommendations made by this committee are submitted to top management for approval.

Scheduling Purchases

The Purchasing Department and Material Control together work out a schedule of purchases to be made in order to meet the projected manufacturing schedules. Recommendations to management are made on a quarterly basis. A list of proposed purchases for a specified period of production goes to the Manufacturing Committee, then to the Executive Committee of the Board. Written approval of the Executive Committee is necessary before the purchasing program begins to operate.

The result of the careful procedure is that no buying is done that Management is not fully aware of, and all purchasing is Management-approved *in advance*. Occasionally it is necessary to buy for a longer period than the recommendation covers. For instance, glass bottles are practically impossible to obtain during the hot season, as glass workers cannot stand the extreme temperatures. In such cases, Material Control

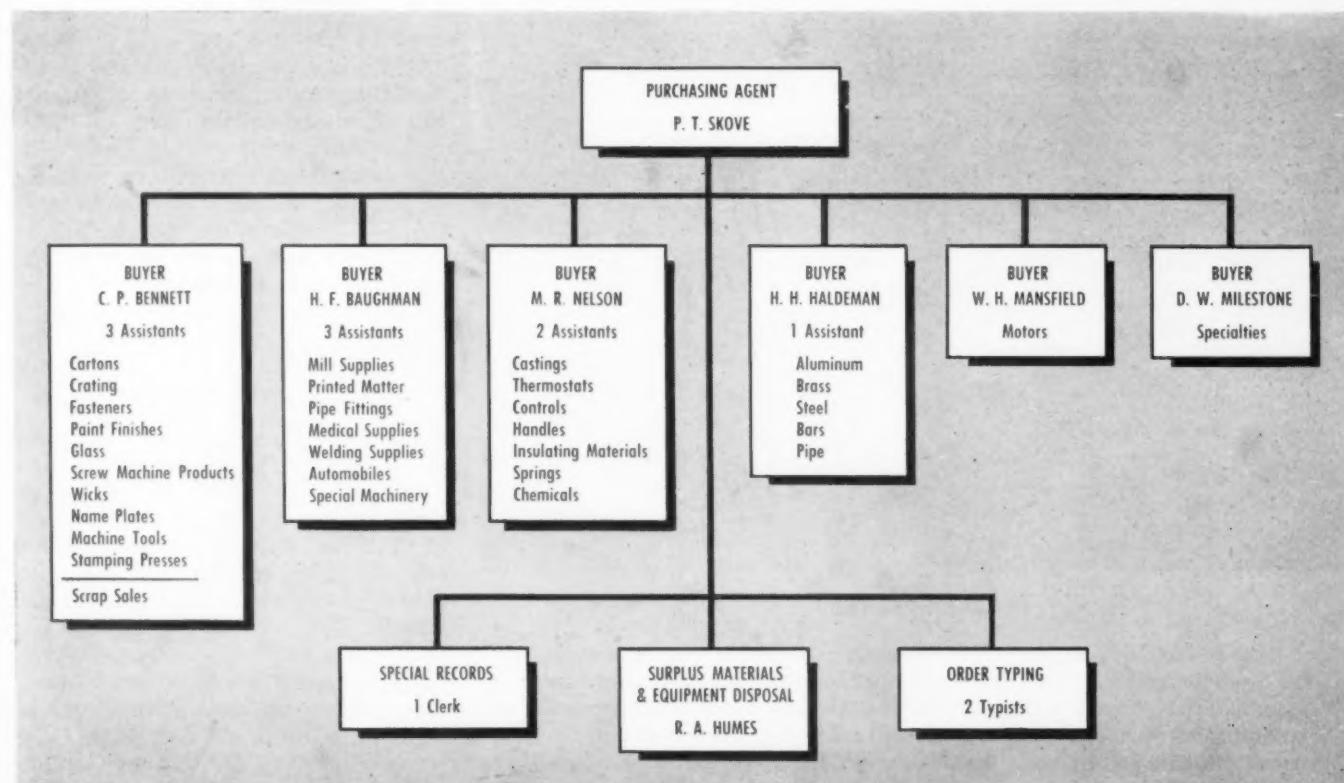
will not issue a purchase requisition until top management has approved the special purchase. Basically, however, we buy in the present quarter what we expect to use next quarter, and the purchasing schedule is under constant revision.

Buyers' Operations

As indicated by the organization chart, buying responsibility is assigned according to several groups of related commodity classifications. One buyer, with his staff, procures packaging materials, fastening devices, screw machine products, cotton wicks, solder, formed wire goods such as oven racks, glass oil bottles, oven door windows, glass heater globes, and machine tool equipment. This buyer also handles the disposal of all scrap and waste.

In purchasing a piece of equipment, the Production Planning Department plays a large part, but once the specifications are decided upon, two buyers collaborate in preparing the purchase order, checking each detail carefully, then following the order closely until the equipment is actually received.

Another buyer, with his staff, purchases chemicals for porcelain enamel. Some of the enamel frit is purchased, some is made at the plant. The chemicals required for this purpose include borax, feldspar, fluorspar, and soda ash. In chemical buying, it is very important that the limi-



PURCHASING DEPARTMENT:		Perfection Stove Company -		PLATT or IVANHOE	Material Control
Provide the following for _____		Acct. No. _____	End Use _____	Req. No. _____	4503
Used 194 _____		Quantity _____	P. O. No. _____	Quantity _____	P. O. No. _____
On Order _____		Quantity to Order _____	P. O. No. _____	Quantity _____	P. O. No. _____
R M Stock	Revised	Est. No. _____	JOB	SUPPLY REQUISITION (NOT FOR PRODUCTION MATERIAL)	
A D 51 - 10-47		CREDIT ACCOUNT		DATE	10
QUANTITY		UNIT	PRICE	PER UNIT OF	
				NET CHARGE	
PLATT		RAW MATERIAL REQUISITION		Bal. _____	
C. I. No. _____		(Use only to order Material required for PRODUCTION)		Date _____	
A D 51 - 10-47		Weight Ordered		LINE	
Part Number _____		Part Name _____		Parts Ordered	
F. O. _____		Gauge _____	Size _____	RED TO SUB STOCK DEPT. NO. _____	
Net Prod. _____		Material _____	Substitute _____	Parts Delivered _____	
Bal. Req'd _____		No. per sheet _____	Wt. per "C" _____	MATERIAL _____	
Ordered by _____		Location _____	Wt. Del'd _____	F. O. B. _____	
Approved _____		Sheet Wt. _____	Sheets _____	Terms _____	
Req. filled by _____		Purch. from _____		Buyer _____	
Date _____		Unit _____	Value _____		
Posted _____		Unit _____	Value _____		
BUY FROM _____		Purchasing Agent _____			
Standard Price _____					
Actual Price _____					
P. O. No. 10-47					

Requisition forms

TEMPORARY PERMISSION
By ENGINEERING DEPARTMENT
To Use Parts Not to Drawing or Specification

Name of Part _____	Part No. _____
Used on Models _____	Permit to _____
See sketch on reverse side. Date _____	
Signature _____ CHIEF OF DIVISION	
Copies to Foremen Inspection Department Superintendent Engineering Department Material Control Dept. Sec'y of Mfg. Comm.	
A D 51 - 10-47	

Temporary Permission to deviate
from engineering specifications



Platt Avenue Plant



Ivanhoe Road Plant

Established in 1888 as a small foundry with 30 employees, making hot air registers and sad irons, the company has grown to an organization with 2,300 employees and 1,800,000 feet of floor space devoted to the manufacture of more than 100 models of oil and gas stoves and heaters under the well known trade names—Perfection, Superfex, Ivanhoe, and Puritan.

tations in chemical analysis be strictly adhered to. The usual practice is to make yearly contracts on certain commodities to assure a stable supply. On staple products we usually require three bids, if the volume of purchases justifies such procedure.

Controls, Accessories, Motors

The Engineering Department decides upon devices and automatic parts which go into the appliances. First they test the suitability of the unit to the product; field tests as well as inside inspections are sometimes necessary. Sources of supply are carefully chosen, and in many cases yearly contracts are made with the most reliable manufacturers, resulting in an assured supply and more favorable prices. Service facilities for our customers on the vendors' products are also an important consideration. All data, prices, terms, discounts, shipping dates, and the like are retained in the Purchasing Department for checking with purchase orders.

General Stores Items

These items of supply are stored in various stockrooms throughout the plants, but they are all under the general supervision of the Storekeeper. They include supplies for production and maintenance. A running inventory is kept of each item, on a card in the stockroom. Stock is kept to a 30-to-60 day basis. We avoid placing all the business with a single vendor on these items, be-

NAME OF PART				STANDARD COST	Footage Per Pcs	ACCT. No.	Card No.					
1/30 Dow ① 2050 Dow ①				23 x 3 3/4 x 9/8			Copied by <i>JK</i> Checked by <i>JK</i>					
785 Export (1 to 1) ①				BP 4763 Soft Wood		PLATT						
20 - 2 - 10												
ORDERED		RECEIVED			DELIVERED							
VENDEUR NO.	DATE	ORDER NO.		PARTS	REV. DATE	NET PRICE	UNIT	DATE	REPORT OR DEPT. NO.	RECEIVED	DELIVERED	STOCK ROOM BALANCE
10 4/16	2/15/61			1010	1-1-48 INV	(180) 66	105.00	M	1-1-48 INV			1010
10 4/16	15/5/8			96	"	"	1010	7				96
10 4/16	22/6/20											
10 4/16	22/6/20											
10 4/19	25/5/67											
PART NO. 5164 NAME OF PART 510 INDICATOR PINION				27/64	STAND. COST	25.73 PER CWT	ACCT. NO. 7	SUB OF MASTER	CARD NO.			
					WEIGHT			DELIVERED TO	PLATT	COPIED BY <i>DCB</i>	checked by <i>JK</i>	
					GAUGE	.0403						
					SIZE TO ORDER	1/2						
					WEIGHT OR SPLIT TO							
					KIND OF MATERIAL	SOFT SHEET BRASS IN COILS - LOOSE - COILS 6 INCH I.D. - COILS NOT OVER 75 LBS.						
DATE		MFG. COM. NO.	REVISIONS				ODD SIZES			SUB CARDS		
518	1	325 Wick								S	R	
518	1	980 Wick	Part No. 5229 NAME OF PART EYELETS				Drawing No. 1134			SH	M	
738	1						STANDARD COST .24 PER M			PH	WH	
738	1						SOLD BY MASTER			F	W	
738	1	Repairs					ACCT. NO. 35			EH		
5350	1						Copied by <i>JK</i>					
120A1	1						Checked by <i>JK</i>					
5360	1						PLATT					
121A1	1											
5680	1											
DATE		MFG. COM. NUMBER	REVISIONS				SUB CARDS					
USED ON	NO. PER	USED ON	NO. PER	USED ON	NO. PER	USED ON	NO. PER	USED ON	NO. PER	USED ON	NO. PER	USED ON
518	1	325 Wick		325 Wk.								
518	1	980 Wick		980 Wk.								
738	1											
738	1											
738	1											
ORDERED				RECEIVED			DELIVERED					
VENDEUR NO.	DATE	ORDER NO.		PARTS	REV. DATE	REPORT NO.	PARTS	REV. DATE	REPORT OR DEPT. NO.	RECEIVED	DELIVERED	STOCK ROOM BALANCE
1-1-48 R. M.	2/1/72			50000	1-1-48 R. M.		50000	2/2	1-1-48 R. M.			50000
1-1-48 PROC.				50000	1-1-48 PROC.		50000	2/2	1-1-48 PROC.			50000
1-1-48 CRTD.				100000	1-1-48 CRTD.		100000	2/2	1-1-48 CRTD.			50000
99 9/10	18/1/31			300000	9/10/18/1/31	18/1/31	300000	2/2	9/10/18/1/31			300000
79 1/15	2/1/62			100000	1/15/2/1/62		100000	2/2	1/15/2/1/62			60000
79 1/15	2/3/67			100000	1/15/2/3/67		100000	2/2	1/15/2/3/67			25000
79 1/15	2/7/70			100000	1/15/2/7/70		100000	2/2	1/15/2/7/70			110000
												60000

Material Control Record, showing variations in forms used for crating materials, raw materials, and purchased parts.

cause it is to the interest of the company to maintain an open door policy with all vendors.

When special offerings are made, we generally get mailing notices and investigate whether the material on sale will be of interest to us.

Coal

The Platt Avenue plant uses 8,000 tons of coal per year, and the Ivanhoe plant 12,000 tons. Therefore buying of coal is an important item. We make annual contracts with our suppliers and specify the approximate tonnage to be delivered to each plant each month.

The selection of the most efficient fuel is made only after thorough tests, keyed particularly to the boiler equipment with which the coal is to be used. A new, modern power plant with automatic stoker is now being installed at the Ivanhoe plant. Storage of the coal is also an important factor.

The Purchasing Department issues the purchase order for each month's coal deliveries, scheduling a certain number of cars for delivery each week. The superintendent of the boiler room reports to the Receiving Department when the cars come in, with car numbers and weights.

One buyer handles the purchases of metals, including aluminum, brass, copper, and steel in a variety of forms — carbon, stainless, sheet, strip, hot and cold finished bars, wire, pipe, tinplate, terne plate, and galvanized sheets. Conditions have been abnormal in practically all of these lines since 1941.

The policy in buying these basic materials has been to maintain as many active sources of supply as possible, while keeping the volume attractive to the suppliers; to distribute the business equitably, and to cultivate the good will of suppliers. It is especially important to maintain alternative sources for gray iron

VARIETY OF REQUIREMENTS IN PERFECTION STOVE COMPANY BUYING

VARIETY OF PRODUCTS

Number of Models

14 Cooking Stoves and Ranges
3 Portable Ovens
5 Water Heaters
11 Space Heaters
4 Portable Heaters
12 Engine Heaters
17 Accessories for Stoves and Heaters
45 Furnaces
4 Accessories for Furnaces

115

1,000 Active Repair and Replacement Parts

TYPICAL VARIETY OF ITEMS IN 1 MODEL No. 62 FURNACE

Number of Items

115 Sheet steel, angles and bars
20 Pipe and tubing
10 Castings, gray iron and brass
29 Pipe Fittings, iron and brass
19 Motors, Thermostats, Transformers
13 Belts, Sheaves, Blowers, Filters
30 Electrical Fittings, Wire, etc.
7 Name and Direction Plates (Metal)
21 Directions for installing and operating, packing slips, etc. (Printed)
60 Fasteners (Bolts, Screws, Rivets, Nuts, Washers and Nails)
23 Paint, Welding Materials, Solder
25 Crating Lumber

372

General view of the Material Control Department



Charles P. Bennett, Buyer, conferring with his assistant, Donald A. Fetzer



castings. Personal contacts established by visiting the vendors' plants have been helpful in achieving the most satisfactory results.

Reception of Salesmen

We utilize the standard buyers' guides, and maintain a complete file of vendors' catalogs. It is recognized, however, that a great deal of valuable information comes to us through the sales representatives who call regularly on our buyers. Our four principal buyers have been with the company an average of twenty-five years apiece, and their experience and judgment are invaluable. They can tell quickly whether or not a salesman has something which will be of interest to one of our departments.

Our policy is to treat all salesmen courteously and cordially. We take care of our visitors promptly, and they rarely have to wait in the reception room more than a very few minutes. We can always find some way of taking care of them, and we feel it is bad psychology as well as bad manners to have anyone cool his heels for an indefinite period in a waiting room. Furthermore, we know that the salesman's time is valuable to himself and to his house, and we would not want anyone to waste our time that way.

We have no objection to having the salesman talk to some one else in the organization. He may have something the Engineering Department would want to know about. If

so, we steer him to them, and if the matter develops further we take part in the later conference. Representatives of machinery and equipment builders may be referred to the Production Planning Department.

Our department acts, therefore, in many cases, as a screening division, contacting the executive who is the logical one for the man to see. It may or may not develop into a purchase. If it does, he comes back to us for that part of the transaction.

Our buyers join in conference with the engineers whenever an equipment purchase is contemplated, and stay with the project until all matters are completed, so far as the Purchasing Department is concerned.

Material Control Procedure

The Material Control Department consists of 21 persons, whose main functions are: requisitioning material through the Purchasing Department by the issue of purchase requisitions; designating parts to be made from scrap; compiling records and inventories; maintaining stock records; determining production requirements for purchased material; and routing inter-plant material.

Material Control is responsible for having all material in the plant at the time required to meet production needs. The department notes on the purchase requisition the delivery date desired on all purchases, and expeditors in the department take the necessary action to speed up any delayed deliveries.

Material Control is not permitted to change quantities on orders already placed, nor are they permitted to cancel any orders. This is the province of the Purchasing Department, but Purchasing acts only on written notice from Material Control. If the quantities are to be changed, or specifications altered in any way on outstanding orders, this is done only by the Purchasing Department.

The selection of vendors, determination of prices, and the responsibility of placing the order, getting the proper materials, quality, etc., — these duties reside solely in the Purchasing Department.

Material Control Record

The Material Control Stock Record Card is probably unique in the range of information it contains and the number of functions it performs. This is a large form — 12 x 9½ inches — on heavy card stock. There are three variations, adapted to par-

PERFECTION STOVE COMPANY

OFFICE OF

Secretary of Manufacturing Committee

May 5, 1948

#2535

The Manufacturing Committee approved the Change Request by Mr. M. W. Patrick for the Engineering Department to apply to the 11, 15, 16, 17 All Gas Furnaces and 94 and 95 Oil Furnaces.

Description of Changes

ADD: Control Panel Terminal Block purchased from Burke Electric Company #100L with three terminals - 1 req'd used on 11M, 15M, 15X, 15LP, 15BA, H15X, 17M, 17X, 17LP, 17BA, H17X, H17K, H17LP Gas Furnaces and 95 Oil furnace. (Note: This BLOCK will have the terminal and screws omitted from the BLACK shown on the target strip.)

ADD: Control Panel Terminal Block, Part #429-D-70 purchased from Burke Electric Company #100L with four terminals - 1 req'd common to 60M used on 15M and 17M Gas Furnaces.

ELIMINATE: Control Panel Terminal Block, Part #429-F-70 1 req'd used on 15M, 15X, 15LP, 15BA, H15X, H15M, 17X, 17LP, 17BA, H17M, H17X, H17LP, and 2 req'd used on 19M, 17M. (Note: This will revise the specifications to read as follows) Line 25, Page 13, read as follows:

Part #429-F-70 - Control Panel Terminal Block 1 req'd used on 15M, 15X, 15LP, 15BA, H15X, H15M, 17M, 17X, 17LP, 17BA, H17M, H17X, H17LP.

ELIMINATE: Control Panel Terminal Block, Part #429-D-70 - 1 req'd used on 95 Furnace.

The purpose of this change is to save operation of removing terminal and screws from the BLACK target and assemble to the red target.

This change is to become effective immediately, and parts on hand are to be used on other model Gas Furnaces.

CHANGE REQUEST

No. _____

Mfg. Comm.

Note No. _____

Date _____

To apply to Models No. _____

Description of changes _____

Purpose of changes _____

Change to take effect _____

Disposition of old parts on hand _____

Are specifications affected? _____ Are directions affected? _____ Are repair parts affected? _____

Is Und. Lab. or ACA approval needed? _____ Has this approval been obtained? _____

Samples submitted herewith _____

Spec's and _____ Submitted herewith _____
Drawings are _____ To be made by _____ Signed _____

Engineering Department report on changes recommended by other departments _____

Signed _____

Eng. Dept. Date _____

APPROVED by Mfg. Committee _____ Change Request No. _____

REJECTED _____

Notification of change in specifications. This request becomes effective when approval by Manufacturing Committee is noted thereon. It is supplemented by a hectograph sheet showing details of the change and the new specification.

CLASSIFICATION OF RAW MATERIALS AND GENERAL STORES ACCOUNTS

1. Acids Ammonia, Cement
2. Aluminum, Magnesim, Monel Metal
3. Directions, inspection tags, packing slips (printed paper) and decals
4. Naphtha, kerosene, fuel oil
5. Bolts, cotter, nuts, rivets, screws, washers and Tinnerman fasteners
6. Glass—bottles, globes, gauges
7. Brass and Copper—sheets, rods, wire, tubing
8. Plating and buffing supplies and porcelain enamel chemicals, glycerine
9. Cartons, wick boxes, strawboard, felt, tape, excelsior pads, cellulose pads
10. Castings—iron, steel, malleable and composition metal
11. Japan, enamels, lacquer, thinners, paints, varnish, bronze
12. Crating—boxes, shooks
13. Racks and bails
14. Pipe Fittings—tees, nipples, ells
15. Mica
16. Handles, catches, hinges, knobs, locks, trim strips and trim clips
17. Nails, tacks, staples, strapping, wire ties
18. Valves—oil control and repair parts
19. Pipe and tubing, steel
20. Solder, pig tin, lead
21. Paper, twine, paper bags, cloth and paper envelopes
22. Ternes—short and long, tin plate
23. Wicks—stove and heater
24. Wire, screw stock, C.D. & H.R. bars
25. Welding supplies, including silver solder and all fluxes
26. Controls, electrical and repair parts, thermostats and repair parts
27. Steel—sheets, cold rolled and hot rolled, strip, cold rolled and hot rolled
28. Springs, orifices, braces, chain, hangers, Commonwealth and Weatherhead fittings, special screw machine parts
29. Insulating material—fiberglas, rock wool, refractory bricks, hydrolene
30. Heat indicators, thermometers, levels, oil gauges
31. Motors
32. Stainless steel
33. Brass castings
34. Steel sheets—galvanized and zinc coated
35. Miscellaneous, bumpers, buttons, caps, eyelets, gaskets, grommets, etc.
36. Regulators, auto air units, burners, dampers, filters, humidifiers, draft regulators, pressure regulators, pumps
37. Belts, pillow blocks, blowers, fans, sheaves, wheels
38. Cords, cable, conduit, loom, covered wire, electrical wire
39. Switches, breakers, relays, resistors, rheostats, transformers, voltmeters
40. Valves, solenoid, magnetic, pilot and shut off
41. Name plates (metal), direction plates (metal)
42. Tanks (water heater)
51. Babbitt, lead pipe, soldering coppers
52. Belting, pulleys, cables, chain, belt hooks
53. Bolts—carriage, machine, stove; screws—wood, cap, set; nuts, rivets, washers, screw eyes, springs
54. Boots, shoes, shop coats, gloves
55. Cement, brick, sand, clay, acetone and tile
56. Castings—iron, steel, brass
57. Coal—blacksmith
58. Medical supplies
59. Drills, taps, cutters, reamers, slitting saws, mills
60. Electrical supplies, other than auto dynamo and repair parts, compensators and starting box parts
61. Emery sheets, sticks and paper
62. Files, hacksaw blades
63. Hand tools, such as hammers, wrenches, handles, picks, forks, pliers, punches, shovels, brooms, brushes, rules, screw drivers
64. Lamps, other than auto
65. Lumber, not crating
66. Machinery, motor dynamos, compensators, starting boxes
67. Machinery parts, oil and grease cups, other than auto
68. Parts—motor, dynamo, compensator and starting box
69. Miscellaneous—toilet paper, steel wool, baskets, paper bags
70. Nails, brads, tacks, twine and paper
71. Oils, grease, lubricants, other than garage supplies
72. Packing, gaskets, mechanical rubber goods, hose and tubing
73. Paints, varnish, white lead, shellac, turpentine, linseed oil
74. Pipe fittings
75. Rags, waste, towels, cheese cloth, burlap and felt
76. Restaurant supplies
77. Stationery, printed forms, and office supplies
78. Stationery—Printing Dept. unfinished material
79. Construction and plumbing equipment such as doors, sashes, toilets and wash basins
80. Detergent, soap, Oakite
81. Steel—machine, drill rods, bar iron, band steel
82. Steel—tool, carbon, high speed, tool kits, steel bails
83. Tubing
84. Valves
85. Wire
86. Garage supplies
87. Gasoline
88. Lubricants
89. Carboys, drums, barrels, containers, etc.

ticular classifications of materials, but basically the same type of information is included on each, and they are used in a similar manner. Form AD269 is used for steel, brass, copper, aluminum, and other basic raw materials; Form AD429 is used for purchased parts; and Form AD303 is used for crating materials, which are an important category in this business. A separate card is maintained for each item.

This record provides complete information for the development of purchase requirements, as well as the record of purchases authorized, orders issued, and deliveries received. It includes a complete description for ordering, including authorized changes and revisions; the use to which materials are to be put; standard cost, account number, and stockroom location; quantitative data such as number of pieces per pound or number of pieces per sheet of flat stock; net parts required, total parts required with percentage allowance for scrap; total parts provided and number to be provided, translated into ordering quantities; and purchases, identified by authorization number and purchase order number.

After the sales budget has been approved by management, Material Control prepares work sheets listing the total authorization for each model and for repair parts. These work sheets, showing quantity of each product and total dollar value, are then submitted to the Manufacturing Committee for approval.

Each Material Control Card indicates the number of parts used per model. The total quantity requirement — whether of purchased parts or of brass or steel sheared to size — are determined by multiplying the number of parts per model by the number of each model to be manufactured. The quantities shown on the cards are piece and part quantities. The cards are set up by blank or sheared size, since steel and other raw materials are, in most cases, purchased in the most economical size to prevent undue shearing or trimming losses. Cumulative requirements are posted to coded cards designed to keep the related materials together. The cards are filed in code sequence.

This control card has proved to be a very practical and valuable record. The one possible disadvantage of the system is the fact that a new card must be written for each item every year, following the annual inventory. But this has its ad-

vantage, too, in that it keeps the individual cards and the current files from becoming overcrowded.

Purchase Requisition

Raw material stock is made up of items which go directly into production as part of the finished product, such as steel, brass, and purchased parts. The Material Control clerk completes the control section of the card by adding in the scrap allowance and noting the number of parts necessary to meet the total requirements. (The same procedure is followed on purchased parts and crating materials.) A purchase requisition is prepared in duplicate for the quantity required, and the duplicate copy is retained by the Material Control Department. The requisition also shows which of the two plants is to receive the material.

In most cases, the quantity is rounded out to even figures for convenience in ordering. The delivery requirements are also noted. The quantity to be ordered is then entered on the record card. The purchase requisition goes to the Purchasing Agent for approval, and he passes it along to the buyer for placing the order.

Any increases in the quantity to be ordered, for the purpose of securing better prices, etc., are referred to Material Control and to the Purchasing Agent for approval.

When the order is issued, Material Control receives a copy, and this information is also entered on the record card.

Receiving Report

The report of material received is made out in triplicate. One copy is sent to Material Control, where the information is posted to "quantity received" and to the cumulative total. One copy goes to the Accounting Department to be checked with the purchase order and invoice, and is held there until the transaction is complete. The third copy is retained by the Receiving Department for reference.

Partial shipments are so reported by the Receiving Department to Material Control and Accounting, and are also recorded by the Receiving Department on its copy of the purchase order.

Duplicate invoices, as received by the Accounting Department, are referred to Material Control for posting the price on the record card and making the necessary adjustments for over or under shipment in the "quantities ordered" section.

A-2. CUT CARBONATE FORM			
Purchase Order		Deliver To FROM Perfection Stove Company GENERAL OFFICES 7609 Platt Ave., Cleveland 4, Ohio	Charge to Acct. No. No. 27923
To		Deliver to 7609 Platt Avenue Our Receiving Department is usually closed on Saturday.	
PO#	SHIP VIA	P. O. #	TERMS
QUANTITY	DESCRIPTION		PRICE
END USE			
We certify the above articles are ordered: } To be incorporated as part of manufactured product. } To be used or consumed in the manufacture of our product. To be used in interstate commerce. For Resale. Vendor's license Nos. 1,008,262 and 1,820,696			
ADDRESS ALL COMMUNICATIONS TO MR PERFECTION STOVE COMPANY <i>P. T. Stove</i> PURCHASING AGENT			

Purchase Order

Perfection Stove Company
Material Control Division

ORDER CHANGE REQUEST

To Purchasing Department:- Date _____

Attention Mr. _____

You are requested to change the following orders or requisitions:-

<u>VENDOR</u>	<u>Our order or Req.</u>	<u>Their order</u>	<u>Item</u>

Change from _____

Change to _____

Reason for change request _____

Confirmation of change to be sent to Material Control Division **immediately**.

SIGNATURE

Request for Change in Purchase Order

Material Schedule and Follow Up					Master _____ Subs _____ Wt. _____ Parts per sheet _____ Wt. per C. _____			
Blank _____	Cr. _____	Size _____						
Material _____								
Used On	PRODUCTION SCHEDULES				Bal. due on Order	Order No.	Vendor	Shipping Priority
1305	Jan.	Jan.	Jan.	Jan.				
1306	Feb.	Feb.	Feb.	Feb.				
2113	Mar.	Mar.	Mar.	Mar.				
2114	Apr.	Apr.	Apr.	Apr.				
2630	May	May	May	May				
2640	June	June	June	June				
2650	July	July	July	July				
2130	Aug.	Aug.	Aug.	Aug.				
2140	Sept.	Sept.	Sept.	Sept.				
2150	Oct.	Oct.	Oct.	Oct.				
2163	Nov.	Nov.	Nov.	Nov.				
3040	Dec.	Dec.	Dec.	Dec.				
3050	Rep.	Rep.	Rep.	Rep.				
3140								
3155								
3168	Auth. Purch.	Ordered	Total Rec'd	R. M. Stock				
52 Acc.								
34 Acc.								
35 Acc.								
36 Acc.								
	Repairs	Repairs	Repairs	Repairs				
					Part No. _____			
					Part. _____			

Schedule of requirements and deliveries, used for planning and follow-up

Classification of Raw Material Accounts					
Classification		On Hand First of Month	Received During Month	Used and Shipped During Month	On Hand Last of Month
1. Acids.	Ammonia, Cement.				
2. Aluminum.	Magnesium and Monel Metal.				
3. Directions, inspection tags, packing slips, (printed paper) and decals.					
4. Naphtha, kerosene, fuel oil.					
5. Bolts, cotter, nuts, rivets, screws, washers and Tinnerman fasteners.					
6. Glass—bottles, globes, gauges.					
7. Brass and Copper—sheets, rods, wire, tubing.					
8. Plating and buffing supplies and porcelain enamel chemicals, glycerine.					
9. Cartons, work boxes, strawboard, felt, tags, leather pads, cellulose pads.					

Classification of Accounts, with monthly record of usage and inventories

When a production order is issued to the factory, a copy of the order is forwarded to Material Control. Requisitions for raw material are issued by the Production Control Department. Three copies are sent to Material Control, where a clerk enters on the requisition the material specification and the weight of material required, and notes in pencil on the record card the number of pieces requisitioned. Requisitions are filled by the stockroom, and the white copy is returned to Material Control. The pink copy goes back to Production Control, and the yellow copy is retained by the stockroom. Material Control enters the information from the white copy on the record card, showing delivery of

the material and balance on hand. The requisition is then priced, showing both standard and actual costs, and sent to the Cost Accounting Department.

Production Orders

Requisitions for purchased parts are issued by the foremen of the various departments as required, and are sent by them to the stockroom for filling. A copy of the filled requisition is forwarded to Material Control for posting as previously described. The stockroom notes the balance in stock, as shown by its records, on the requisition form, and this balance is checked against the balance shown on the record card in Material Control.

When material stocks are not sufficient to fill the net requirements, the Production Control Department is notified and the requisition is held until the material is received in the plant. If the production is required forthwith, the quantity requisitioned for production is reduced below the requirements, by instruction of the Production Control Department, which then issues a shortage requisition to cover the difference.

Production supplies that cannot be figured on a unit basis are ordered in accordance with maximum and minimum requirements established by the Material Control Department. All parts that cannot be computed on a unit basis are ordered against schedules.

Classification by Products

The large Material Stock Record Cards are sorted and filed under six main categories, representing products made by the company:

1. Cook stoves and ranges
2. Space heaters
3. Furnaces
4. Water heaters
5. Portable heaters.
6. Miscellaneous products.

The materials in the stockrooms are purchased and stored for the manufacture of these products. Therefore the raw materials and purchased parts which relate to a certain product are recorded together. Each item bears a distinct relation to a finished product, and they are so recorded.

These classifications are further subdivided. For instance, there is a complete set of cards for each of the above classifications for steel, brass, aluminum, bars, angles, pipes, etc., these being the raw materials used to fabricate the various parts of the product. Further, there is another complete group of cards, by products, for all purchased parts going into their production, such as thermostats, motors, controls, glass bottles, bolts, screws, etc.

Perfection Stove Company produces catalog goods, which are constantly reordered. It is not a job shop, therefore every product is standard and its make-up is known. Occasionally a special product is sold which requires special treatment, but in the main the products are standard, and every pound of raw material and every purchased part is known and calculated.

Bill of Material

How do we get a record of all the material that goes into a model?

The Engineering Department makes up a sample model which is approved by top management as a part of the line. Then they make up a master Bill of Materials, together with the necessary drawings and specifications, covering every item which is a part of the model.

In one typical set of specifications there are 36 models, requiring 32 pages of typed details. With all this information, the Production Planning and Material Control Departments decide on the size of sheet metal to be purchased, taking into account the unit size required for each part and the most economical size based on schedules of prices for widths and lengths of sheet steel, etc.

This information is transferred to the Material Control cards for each main class of product, with all the product numbers listed thereon. It is possible to have as many as 100 stock cards for one set of specifications, particularly on purchased parts.

Schedule and Follow-Up

A Material Schedule and Follow-Up form is used by Material Control (1) for the purpose of determining delivery dates on new purchase requisitions before they go to the Purchasing Department, and (2) as follow-up information for the expediters. If Purchasing is to buy 100,000 units of an item, Material Control determines how the goods are to be delivered, in what quantities and on what dates.

A D 67 1247

Perfection Stove Company
DAMAGED AND DEFECTIVE MATERIAL REPORT

Mr. P. T. Skove,
Purchasing Agent

Date _____ 19____

The following material, damaged or defective, is reported for reasons given below:-

Item _____	Part No. _____	
Vendor _____	Receiving Report No. _____ Purchase Order No. _____	
Date Received _____	Quantity Received _____	Quantity Inspected _____
Quantity Damaged or Defective _____	Description of Damage or Defects	
_____ _____ _____ _____ _____		
Total Quantity Damaged or Defective.		
Inspected by _____	Reported by _____	
Purchasing Department Action		
Notified Vendor - Date _____ 19____	_____ _____ _____	
Returned for:- Credit <input type="checkbox"/> Replacement <input type="checkbox"/> Repair <input type="checkbox"/>	_____ _____ _____	
Delivery Ticket No. _____ Debit Memo No. _____ Purchase Order No. _____	_____ _____ _____	
Return Billing to Vendor - Price _____ Unit _____ Total \$ _____	_____ _____ _____	
Send original and duplicate to Purchasing Agent. Copy to Inspection Department. Copy to Material Control Division. Retain copy in department making report.		
SIGNATURE _____		

Defective Material Report, from Inspection Department



Assistant Buyers in the Purchasing Department;
Buyers occupy the private offices at left



Order writing section, Purchasing Department

**DISPOSAL REQUEST
FOR
OBSOLETE OR SURPLUS MATERIAL**

To Purchasing Department

Date _____

Attention: _____

Item _____ Part No. _____ Acct. No. _____
Dimensions _____ New Description Used _____

Name of product or Assembly used on

R. M. Stock Platt Ivanhoe General Stores Stock Platt Ivanhoe

Vendor _____

P. O. No. _____

P. O. Date _____

Invoice No. _____

Total Cost _____

Unit Cost _____

Book Value _____

Reason for Disposal Request:

Can it be used for other product?

Material Control Department

By _____

Suggested Disposition:

Approved Disposition:

(1) Returned to Vendor _____ S. O. No. _____ Date Shipped _____

(2) Salvage _____

(3) Scrapped _____

Net Return _____

Loss or Gain _____

Credit Memo No. _____

Date Completed _____

Purchasing Department

By _____

Authorization for Disposal of Surplus

Record clerks posting receipts
and withdrawals, General Stores



This form does not leave the Material Control Department. One of these schedules is made up for every item purchased, corresponding to the Stock Record cards.

Storeroom Controls

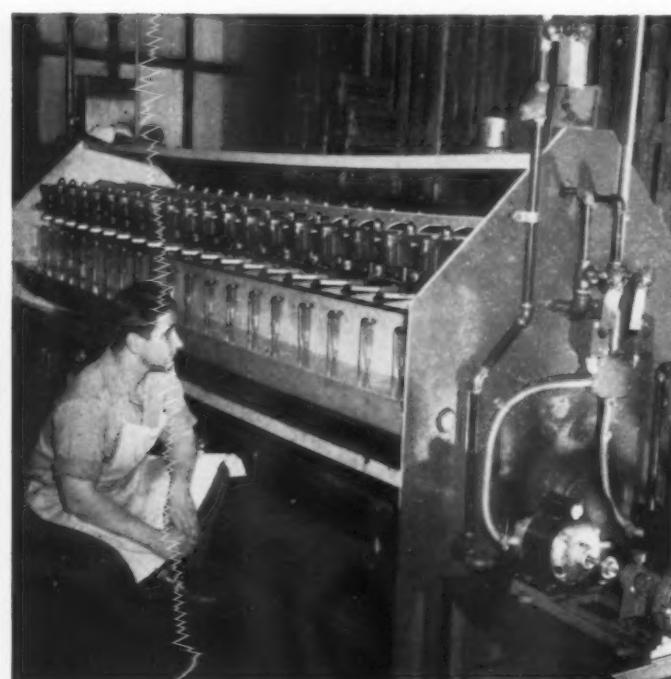
The Storekeeper, who reports to the Plant Superintendent where the stockroom is located, has charge of all material stores, including raw materials, purchased parts, and maintenance and operating supplies. He is also in charge of the Receiving Department.

Pile tags and bin tags are used in the stockroom to keep track of raw materials. These materials are withdrawn only on requisitions signed by both Production Control and Material Control.

Simplified stock record cards are maintained in the stockroom for purchased parts used in production. Receipts, withdrawals, and balance in stock are shown on these records. Purchased parts are withdrawn on material requisitions signed by the foreman of the production department receiving the material. Purchased parts rejected or spoiled on the assembly floor are covered by a "return requisition" form. A copy of this is sent to Material Control for adjustment of its records.

The control records for maintenance and operating supplies and tools, all of which are classified as "general stores", are maintained in

Inspection Department running a
test on oil control valves



the stockroom office and do not clear through Material Control. These records show receipts, withdrawals, and balance in stock. The minimum quantity stocked and ordered is determined on the basis of usage requirements. Purchase requisitions for replenishment of stock are prepared by the stock record clerk, and the quantity specified in the requisition is posted to the stock record card in pencil, being inked in when the receiving report is received. The prices are entered from a duplicate invoice.

Items of material not regularly carried in general stores are procured upon presentation of a signed requisition, and such items may be stocked at the request of a Supervisor, with the approval of the Purchasing Department.

Inventory Turnover

All materials, as they are received, are charged to their respective Account numbers. These charges are made from the invoices received. Likewise, all materials delivered to the plants on requisitions are valued and deducted from the appropriate Account. The inventory is priced at cost or market, whichever is lower, and material requisitions are priced on the basis of "first in, first out".

Material accounts are kept by number. For instance, Account No. 1 includes acids, ammonia, and cement; Account No. 2 includes aluminum, magnesium, and monel metal. General Stores numbers start at 51, which includes babbitt, lead pipe, soldering copper, while 52 includes belting, pulleys, cables, chain, belt hooks, etc.

At the end of each month, the Cost Department issues a complete statement of all these accounts, showing the money value of items on hand on the first of the month, received during the month, used during the month, and on hand at the end of the month. Separate sheets are used for raw materials and general stores accounts.

A summary is made up from this record, showing the rate of turnover, or number of months' supply on hand. This figure is arrived at by dividing the value of materials on hand at the end of the month by the value of materials used during the month.

Purchase Order

The purchase order form (9 1/4 x 8") is prenumbered, with separate series of numbers for the Platt Avenue and Ivanhoe Road plants. These series are further differentiated by using a white original for Platt or-

ders and yellow for Ivanhoe. Otherwise the forms are identical. Six copies are made of each order, distributed as follows:

1. Original to vendor.
2. Green copy to Accounting Department, where it is held and checked with invoice and receiving report, then approved for payment. In case of any discrepancy, the invoice is sent to the buyer for adjustment; the Accounting Department makes no contact with vendors. All invoices for machinery and equipment are referred to the buyer, who gets an OK from the Plant Superintendent involved.
3. Yellow copy to the Receiving Department.
4. White copy to the buyer who placed the order; filed alphabetically by vendors' names.
5. White copy to the Purchasing Department file, arranged numerically for cross reference.

6. Copy on heavy card stock to Material Control for their records, and as the basis for follow-up.

The reverse side of this copy is ruled for the entry of receipts, unshipped balances, and a record of follow-up action.

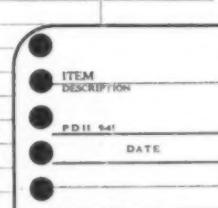
During 1947, 21,000 purchase orders were issued.

Visible Cost Record

The Cost and Pricing Department is charged with the responsibility of setting up the cost of every item going into the finished product, for the purpose of arriving at a selling price. This information is furnished by the Purchasing Department. To have this information readily available, we maintain a visible record in loose leaf form. There is a separate sheet for each item. The prices shown (with date) are not taken from the invoice, as the last purchase price may be obsolete; they represent the price that it would cost to re-

Data Sheet for disposal of surplus machine equipment

MACHINERY & EQUIPMENT DATA SHEET		
PLATT IVANHOE	DATE _____	
KIND OF MACHINE OR EQUIPMENT _____		
OUR MACHINE NUMBER _____	MANUFACTURER _____	
DATE PURCHASED _____	PURCHASE PRICE _____	PRESENT BOOK VALUE _____
SERIAL NUMBER _____	TYPE NO. _____	LOCATION _____
WHEN AVAILABLE FOR DELIVERY _____		
RUNNING CONDITION _____		ANY CRACKS OR WELDS _____
MOTOR DRIVEN _____ BELT DRIVEN _____		
ATTACHMENTS _____		
REMARKS _____		
MOTOR SPECIFICATIONS		
D.C. OR A.C. CURRENT _____	R.P.M. _____	H.P. _____
VOLTAGE _____	TYPE NO. _____	SERIAL NO. _____
PHASE _____	REMARKS _____	
APPROVED BY: _____		
SHIPPED TO: _____ DATE: _____		
ADDRESS: _____		
VIA: _____	F.O.B. _____	SELLING PRICE: _____
CHARGE TO: _____		
ADDRESS: _____		
TERMS: _____	S.O.U. _____	CIRCULAR DATE: _____

P.D. 4-2-51		Material Control Division Shop Order																
Please Provide the Following:-																		
		Order No. R	542															
		Date _____																
		Rec. No. _____																
		Account No. _____																
To _____ Department _____		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; width: 15%;">Date</th> <th style="text-align: center; width: 40%;">Pieces</th> <th style="text-align: center; width: 45%;">Balance</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>		Date	Pieces	Balance												
Date	Pieces			Balance														
From _____																		
To be used for _____																		
Deliver to _____																		
Signed _____																		
Required _____	R. M. Stock _____	Date _____																
Copy to _____	Delivery _____																	
Remarks _____																		
ORIGINAL to department doing work - DUPLICATE to Stockroom - TRIPPLICATE to Material Control Division. <div style="text-align: right; margin-top: 20px;">  </div>																		

Shop Order issued by Material Control for utilization of surplus material

Current Price Record

ITEM DESCRIPTION	PHHD F B			
PD II 541	PART No.			
DATE	UNIT	Material Price	DATE	UNIT

place the item on the current market. These prices are on a unit basis, whether by the pound, dozen, thousand, or whatever the appropriate unit may be.

A record is also made up for each calendar year, showing the total (dollar value) purchases made from each vendor and the general nature of the items purchased. This list is made up, alphabetically, from the Accounts Payable files.

Inspection Procedure

All incoming materials are subject to inspection by the Receiving Inspection Department. This department is a part of Plant Inspection, which is concerned with the quality of all products as they are made, throughout the plants. The procedure involves 100% inspection on numerous items, and spot inspection on others.

Materials received which are not in accordance with specifications are reported on a "Damaged and Defective Material Report". Four copies are made, two of which are sent to the Purchasing Department. One of these goes to the buyer who made the purchase, and one is retained in a master file. The buyer takes the necessary action with the vendor, either returning the goods or arranging for repair or adjustment.

One copy is sent to Material Control to advise them immediately of the defects or damages, and are made aware that the particular shipment, or a part of it, is not accept-

able. The fourth copy is retained by the Receiving Department, pending the action by Material Control and/or Purchasing.

When the buyer completes his action on the report, the copy in the master file is lifted, proper notations are made on it, and it is sent to the general files. If it is decided to return the goods, Material Control originates a delivery ticket authorizing the return of the goods to the vendor. The quantity involved is taken off the stock card in Material Control, and a debit memo is written by the Purchasing Department when the shipment is made, and sent to the Accounting Department.

Engineering Changes

Whenever it is decided that some change shall be made on a model, the Engineering Department issues a Change Notice in the form of a hectograph circular, which is submitted to the Manufacturing Committee for approval. Engineering is responsible for the design of products, and manufacturing is based upon their specifications and bills of material.

The Manufacturing Committee consists of the Works Manager, the two Plant Superintendents, the Assistant Chief Engineer, the Manager of the Production Planning Department, the Chief Cost Accountant, a representative of the Sales Department, the Secretary, and the Purchasing Agent. The committee meets weekly to review all proposed changes.

Following committee approval, the Secretary issues a copy of the circular as notice to all departments and executives concerned. The notice contains information regarding the proposed changes, when they are to become effective, and — what is equally important — what is to be done with the supply of parts on hand. In the Material Control and Purchasing Departments, we insist upon written notices as the authority to make changes, as we have found by experience that it is very unsatisfactory to work under verbal instructions.

Occasionally, material of the exact specification is not available in time to meet production needs on schedule time. Usually it is possible, due to the great variety of items carried, to substitute some other item which will answer the purpose satisfactorily. In such cases, rather than changing our permanent specifications, we secure temporary permission from the Engineering Department to use the substitute part, for a specific instance only. A form is provided for this purpose, and copies are sent to all concerned.

Salvage

Salvage is divided into three classifications:

1. Ferrous — including cast iron, turnings, borings, steel sheet, terne, tinplate, etc.
2. Non-ferrous — including brass clippings and turnings, copper, lead, nickel, tin, and zinc.

3. Miscellaneous — including burlap bags, rags, paper, barrels, etc.

The originating departments sort the scrap and mark it for classification. The non-ferrous scrap goes direct to the storage space assigned to it, and is picked up by a scrap dealer twice a month. The weight is taken by our men just before it is loaded onto the dealer's truck.

Carbon steel scrap, terne plate, and painted carbon steel scrap, properly segregated, is compressed into bundles, put on a conveyor, and dropped into a railroad car. We bill car lots based on railroad weights. Truck weights are obtained by using a certified public scale.

Steel shearings are checked closely before going to the baler, to make sure that there is nothing that can be used in our plants.

A special cutter and scorer has been installed, and the major part of our salvaged strawboard is made into cartons to be used in shipping repair and replacement parts. A shop order is issued by Material Control for the production of small cartons, etc. The strawboard which cannot be thus used is baled with mixed papers.

Obsolete and Surplus Material

Sale of scrap is handled by the Purchasing Department. Regarding prices, we follow the markets closely in national publications.

When material purchased for production becomes obsolete or surplus, Material Control issues a form to the Purchasing Department which is the authority to dispose of such material to the best advantage of the company. The principal reasons

for surplus items are the change of models or changes in the design of individual parts.

The Maintenance, Engineering, and other non-production departments are first checked to see if they can use these items. In case none of them can find a profitable use for the material, we try to return it to the vendor if its nature and value justifies such action. If none of these expedients result in satisfactory disposal, the Purchasing Department proceeds with disposal either by selling it as scrap or selling it to a dealer in miscellaneous supplies. Dealers are circularized and requested to bid.

General stores supplies that become obsolete or surplus (usually determined by lack of usage) are disposed of in the same manner, but in this case the authorization is made out by the General Storekeeper instead of by Material Control.

For obsolete or surplus machinery and equipment, we have a special hectograph "Data Sheet" which originates in the office of the Plant Superintendent. This form gives all the pertinent information needed to issue a circular, which is mailed to machinery dealers throughout an area from St. Louis to the Atlantic seaboard, calling attention to the surplus items for sale and inviting bids on the items listed.

Budget System

Perfection Stove Company has used the budget system for a great many years. We are firm believers in this plan for forecasting expenditures.

The Purchasing Department, as well as all other departments, pre-

pares a budget at the beginning of each calendar year, showing their estimated costs of operation. This budget includes all items of expense, including salaries and the following general breakdown of operating costs:

- (a) Equipment and Repairs
- (c) Travel Expense
- (d) Telephone (long distance)
- (e) Telegrams
- (j) Stationery and Office Supplies
- (m) Sundry Expenses
- (n) Publications
- (o) Organization Expenses
- (p) Entertainment
- (z) Auto Expenses

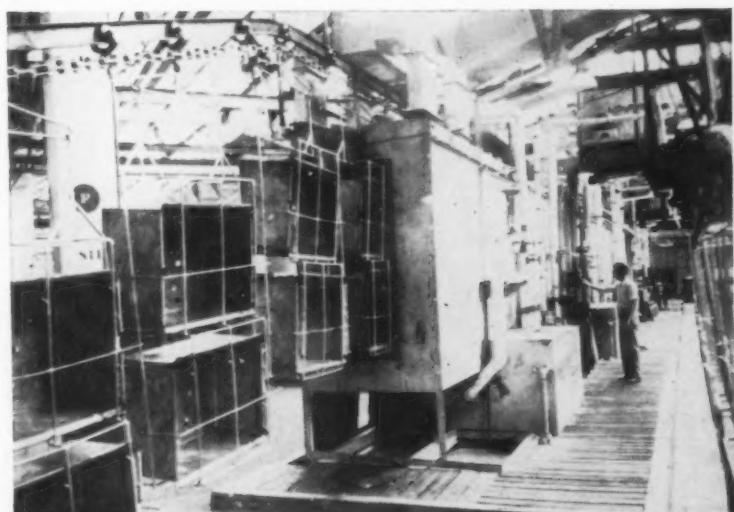
The entertainment item is mostly for taking care of sales representatives of suppliers who happen to be in the office at lunch time. We consider it better to keep the men here until their business is finished, than to have them go out and come back later, especially as there are no suitable eating facilities in the neighborhood of the plant. They are invited to lunch at the company cafeteria, and the expense is charged to the Purchasing Department.

This operating budget shows a breakdown by months, and each month the Accounting Department furnishes the actual figures which can be compared with budget estimates.

Regarding purchasing expenditures and commitments, the Financial Department gets from the Purchasing Department, at the beginning of each quarter, an estimate for the next three months, by months, of the dollar value of proposed expenditures for materials, supplies, and equipment.

Biggest item purchased—an automatic washing, pickling and rinsing machine that prepares fabricated steel parts for porcelain enameling

Smallest items purchased—Mrs. Betty Miller, Secretary to Mr. Skove, shows a handful of the tiny screws and bearings used in assembly



Vendors Can Help Avoid Shipping Claims

Through contact with their own shipping departments, and as buyers from other companies, the nation's purchasing agents are in strategic position to help reduce the stupendous cost of shipping damages and shortages



A single nail in the floor punctured the cans of orange juice, with leakage and damage to other boxes.

By **Edwin Laird Cady**

DURING the first six months of 1947 shipping damage to freight amounted to \$56,184,020. Since the second six months of the year included the heavy Christmas shipments, it is easy to estimate that the total for the year will approach or even exceed the \$120,000,000 mark. The estimate for the year can be further justified by the fact that this type of damage is rising year by year. In 1945 the total was \$78,791,370, and in 1946 \$94,300,672.

The figures undoubtedly are understatements. Some of the larger

receivers of goods and a few of the smaller ones will make a claim for every item of damage and thus get their losses into the statistics, but a large number will accept the losses rather than go to the trouble.

Taking the unreported losses as a factor of safety and then applying further discounts, highly conservative outfitts are arriving at \$120,000,000 as a highly safe estimate for 1947.

There are ways to set up and dramatize this figure. It is one third of the total volume which the entire

machine tool industry expects to do in a normal year, and it is larger than the total annual volumes of some other well known industries. But an absolutely indisputable statement is that the annual shipping damage losses are a \$120,000,000 headache to purchasing agents.

Heavy Indirect Costs

Every damaged case or carton received means an odd number of items in inventory instead of the even number that was ordered, a cost for reporting the damage so a claim can be made, a cost for reporting the number of good pieces entered in inventory if only part of the contents was damaged, a cost for repackaging if contents must be reshipped or rehandled in original packages, a bother as well as a cost for intra-plant and warehouse handling, a cost for entering a claim, arguing about it, accounting for it. Obviously, the indirect costs for damaged packages are greater than the direct ones. And it is only the direct ones for which claims can be entered.

The figures as to who is responsible for all this loss are not at all positive. But a survey now under way indicates that only about 40% of the damage is due to bad-order cars and other faults of the railroads. This survey is being made by the Shipping Container Institute, is on a thoroughly scientific basis, includes the life cycles of more than 700,000 fiber shipping containers as carried in over 500 freight cars all over the nation, and undoubtedly will be considered highly authoritative when the final figures are released.

Since the market is showing definite signs of reverting to its natural condition of being a buyer's one, the 60% or more of damage which is caused by the actions of shippers and handlers is within the control of the purchasing agent whose company is to receive the goods. And although the freight car situation has not improved very much it has reached the point where even a slight recession in business volume will deprive the railroads of all excuse for using leaky or otherwise bad order freight cars. A high percentage of all this damage, then, can be eliminated by the purchasing agents if they desire to take action in regard to the shipping methods applied to the goods they receive.

The purchasing agent may not have equal control over the actions of the shipping department of his own company. But in many instances he does have some control here, either by the indirect method of suggesting that shipping methods be such that lower cost packages and other supplies can be used, or the even more indirect one of telling the shipping department that he cannot get hard boiled with shippers if his own company errs in its methods.

Aside from pressure brought upon railroads and other carriers, there are

several actions the purchasing agent can take. Among them are:

1. Suggest, and where possible demand, that shipping department labor be of higher grade and higher training. A partial analysis of the Shipping Container Institute figures shows a probability that 50% of all damage is caused by careless handling and piling. Shippers and carloading labor was recruited wherever it could be found during the war. Training was somewhat lax; anybody who could train labor to a high degree of personal responsibility was in demand along the production line. But there is little reason for these conditions to obtain today.

2. Prefer vendors who have good materials handling equipment for getting packages to the points of loading actually within the cars. This is a point to be observed when visiting a supplier's plant. No labor is sufficiently low cost right now so that outright hand loading of packaged goods can be performed without the workers becoming sufficiently fatigued to result in poor loading. And materials handling equipment primarily intended for other purposes but "made to do" for freight car loading is likely to result in very poor piling.

3. Demand that the interior of every car be carefully inspected, and if necessary its condition corrected, before loading. This often is a simple matter of having a responsible supervisor carry a flash light or an extension cord safety electric lamp into the car and making a quick inspection, and of using hand tools to make any necessary corrections. Among the factors to be looked for, are:

Water stains, indicating bad order and leakage.

Nails protruding from walls or floors.

Protruding splinters.

Floors specially built for other services but unsuitable for the intended shipment.

Floors wet, as can happen when the car has been left standing with its doors open.

Debris on floors.

Inspect Car Interiors

Of all these, the worst offenders appear to be nails, bits of straps or wires, and splintered or other hazardous boards. The buyer can, if he desires, specify that the shipper is to be held directly responsible for the use of any car which has not been inspected and corrected in accordance with the principles.

4. Specify that all materials and

No doorway blocking. When the door was opened, the ends of the cartons were ripped open by door frame members.



This damage could have been avoided by bending back and nailing down the strapping ends.





If a tag, or a label or placard of this type appears on a shipment received by you, notify the Shipping Container Institute, 475 Fifth Ave., New York, N. Y. It is part of a testing program being conducted by the Institute looking to the use of better containers.

devices used for blocking and restraining the loads shall be of adequate material and workmanship. The idea that any lumber too full of shakes or other defects for any other purpose is "crating lumber" and is to be fabricated by anybody who can handle a saw or swing a hatchet, simply will not do. Specifications of this type are to be found in the fine print which appears on the backs of many purchase order forms, but it is years since a large percentage of even the purchasing agents themselves last paid any attention to those paragraphs.

5. Demand that blocking and bracing be adequate, especially when center aisles are left and only the ends of the cars are loaded, or the goods otherwise are in separated piles within the cars. Multiple stop deliveries, where the cars are loaded by the shipper but are partially unloaded at several stops enroute to the final recipient, require extra care with blocking and bracing of loads.

Blocking and bracing are among those matters (there are plenty of others) in which an ounce of imagination on the part of the car loading supervisor is worth a ton of specifying by the purchasing agent. Among the points to be considered are:

The terrain to be traversed by the freight car: mountainous or other terrain involving steep grades and sharp curves obviously requiring more thorough restraining of the loads.

The physical sizes of the packages. Some packages are of such

outside dimensions that if piled in correct multiples they "fit naturally" into standard freight cars; others are not and are in greater need of restraining. If the bracing does not fit the packages then they may be more damaged by the bracing itself than they would be by the cars if left unbraced.

The weight per cubic foot or the specific gravity of the package. It is obvious that heavy packages are more damaged by falling and light ones have relatively larger surface areas which may be abraded, but there also is a medium size which, especially if somewhat resilient, tends to squeeze out of the middle of the face of a pile. Such a package if bearing against a car wall or against another pile may take much of the entire force of all the other packages in its pile as the car sways and jolts.

The shapes of the packages. A tall and narrow package presents a different bracing problem than a long and wide but low height one.

The center of gravity. Bracing which bears materially above the center of gravity of any package can do damage to the package and also can cause one package to cock in such a way as to injure another.

The fragility of the contents of the package. The strapping, stapping and other closing and securing means applied to the package itself. Bracing can "work with" the packaging reinforcement and thus

augment its strength, or can work against it.

Bracing requires special ingenuity when several different sizes, shapes and specific gravity packages are loaded into the same car. Often it requires package and package material and even packaging method specifications to be changed so that bracing can be practical. But in most instances fully adequate bracing adds nothing whatever to shipping costs, even though a really good salary be paid to the car loading supervisor.

As an aid to adequate bracing, booklets and other literature presenting practical engineering studies of the subject can be had from makers of steel strapping and other equipment.

Blocking Car Doors

6. Block the car doors. As loaded, the interior surface of the car should present continuously straight and flush surfaces to the packages. If this is not done then the packages tend to work their way into the door areas, to wedge themselves tightly there, and thus to be torn and damaged when the doors are opened.

In some instances when center aisles are left, packages may fall to the floor and be undamaged but may then work their way into the door ways and be damaged when the doors are opened.

Door blocking involves many of the factors of bracing. The blocks must "fit" the packages in regard to sizes, weights, shapes, specific gravities and centers of gravities. But there is an added problem. Some car loading labor will "paint itself into a corner" in the sense that it gets the car loaded and then has no working space in which to apply steel straps or other nailed-on blocking. This may be a matter of control by the loading supervisor. Or it may require the construction of special door filling structures which are placed in position and are held there by the door itself. Some of these forms are made knock down and returnable. Others are specified by the purchasing agent to be in the shape of light duty pallets which he can use about his plant.

Photographic Evidence

7. Use a camera. The simplest and least expensive camera in the hands of the receiving clerk will be adequate to take pictures of incoming loads which are damaged. Quickly made cardboard arrows, similar to the ones used in some of the illustrations of this article, can make clear

the sources of damage.

Much of the improvement of shipping conditions will be accomplished by trial and error accompanied by the exchange of information. The car loading supervisor of the shipper cannot travel several hundred miles just to see why his work went wrong, nor will he place full credence in the reports of purchasing agents and salesmen who are "always looking for an alibi". But a clear picture of the damage and its apparent cause will give him the information he needs for the improvement of his work.

8. Design unit loads. This is a trend which was well under way before the war, but was slowed down by lack of supplies. Several packages are strapped or wire-bound or otherwise fastened together into a single unit of size and weight convenient for handling and of geometrical proportions correct for the cars. A car then is loaded unit by unit. It is unloaded in the same way.

There are several advantages. The unit is carried to the warehouse and entered in inventory as a unit, and this adds to convenience and saves costs. The unit places less of a burden on the imagination of the car loading supervisor and permits the loading of cars to be "pre-engineered" by the materials handling en-

gineers of the shipper or of the receiver. The unit reduces car unloading costs, may even reduce trucking costs if trucks are to be used.

9. Specify palletized loads. This is another form of the unit load, but is useful where the pallet will divide the carload into independently braced sections, will reduce the costs of loading and unloading the car, and is useful to the plant of the receiver. Many returnable types of pallets have been designed, and it is to be expected that as loss and damage problems are studied more thoroughly the use of these devices will increase.

Purchase Engineering

10. Use more purchase engineering. Before the war there was the beginning of a movement to specify not only what was to be loaded into each car and how it was to be braced, but also the exact position of each unit or pallet load.

Large companies even went so far as to send blue prints specifying the loading of each car, with warnings that failures to follow the prints would count against sources of supply.

Behind this were several purposes. Incoming merchandise was handled more efficiently into the warehouse, fragile materials were at the tops and

not at the bottoms of loads, goods were easier to route to scales for computing or to the desired positions along the production line, the goods least likely to be damaged by car leakage could be specified to be closest to the car doors where leakage is most likely to occur.

This was one of the extremes in purchase engineering. Excepting for war use it largely had to be abandoned under conditions where shippers had to take any freight cars they could lay their hands upon, and load them in any way they could. But now the loading blue print practice is coming back, especially among men who learned its value when they saw it applied to military uses.

Nothing about car loading practices can compensate for inadequate design and specification of cartons and other packages, of course. But the costs of packaging can be reduced if shipping practices are improved.

Shipping practices can be improved if the purchasing agent first demands that they be, and then supplies photographs and other cooperation to show what is wrong, and finally applies adequate purchase engineering so that the materials handling and other engineers can help him to obtain the necessary degree of control.

Fine doorway blocking. Here the wooden bracing is covered with heavy paper so that the paper bags will not be torn by the rough edges of the wood.



Boxes of soap slipped between the widely spaced strapping and were crushed when the door was opened.



Good Times Ahead

● By Grey Leslie

There is a tremendous world-wide demand for production of goods and services to promote economic standards and stability and America must furnish the leadership

HERE is a heartening optimism in the phrase, "Good times ahead," but it requires some qualification to justify it. If we can back away from the excitement of the daily headlines that chase our thought off on disturbing tangents, we can agree on the premise that the world is acutely suffering from a famine of capital investment funds.

It is significant that communists, socialists and capitalists are at least agreed on this one point, and even that little oasis of agreement in a desert of bitter antagonisms is a sign of hope for some degree of rationality in the world.

If one this capital famine could be remedied even partially, the basis for a growing prosperity would be established, for it is axiomatic that things in the world go best when the human race is engaged in production of goods and services to meet human needs. A minimum of economic security is a necessary prerequisite to any form of stable government, and capital investment is a prime ingredient of the prescription.

Recovery Requires Production

All of the plans for world economic recovery put forward in the United States and elsewhere, including the Economic Cooperation Administration and the Western European unions, include much more than merely repairing the damage of war. All of them aim at increasing productive capacity and raising living standards far beyond the 1938 levels. The fatalistically minded adherents of the theory that humanity has reached "economic maturity" will be sorely discomfited. Their notion that, despite the poverty of great masses of mankind, opportunities for further capital investment at home and abroad are definitely limited, has been thoroughly disproved. The cyclical pattern has been seriously disrupted and an entirely new set of criteria demands recognition.

There is no nation in the world today outside the United States where the necessities for capital investment are not far greater than the capacity of the economy to provide the funds. Even the Russian Five Year Plans are essentially vast schemes for capital investment. Regardless of the wide difference of ideologies, there is common agreement on the fundamental need for capital; the differences occur as to how the funds are to be procured and who is to operate the plants that are to be built. There are basic economic problems common to each of the rival political systems. The compelling one is that people cannot constantly consume more than they produce. Increased productivity is therefore the prime concern of all, and that fact accounts for the feverish activity of the United States, the United Kingdom and the Soviet to this end.

If the nations are to be provided with increased productive equipment, capital funds must be accumulated. The obvious way to accumulate them is for people to forego the immediate enjoyment of goods and services in the hope of greater benefits later on. This sacrifice, if it can properly be called a sacrifice in the United States, will be far less uncomfortable for us than for other nations already suffering from acute poverty.

Production Requires Capital

The task confronting Americans in the next decade is to maintain our economy, functioning at its peak, and constantly raising our sights to produce goods and services necessary to induce an ever rising standard of living on the broadest possible base. Included in that task will be the more intense mechanization and scientific operation of agriculture and the correction and eventual elimination of underemployment in that field. There will be, inevitably, some major adjustments and some farm casualties, but the change from anti-

quated farming methods will be immeasurably beneficial to our economic progress. We shall be getting more and better results with fewer farm workers. It will of course require greater capital investment per worker than heretofore.

Industry will employ more people in the next decade and will absorb great numbers who will move out of farming. There will be constant shifts and changes in employment and a greater mobility of the labor force than has obtained heretofore.

Expanding service industries, both governmental and private, and the professional and trade groups, will all absorb larger numbers of workers. The correlation between the service industries and national prosperity will be more accentuated. It is important to recall that the most prosperous nations of the world are those which have the most highly developed service industries, particularly in the fields of electric power and modern transportation.

Certain service industries, particularly public utilities, and certain manufacturers, will exploit new patterns of modern urban living. There are immediate evidences that much progress has already been made. Witness the highly successful scheme of taking a major chore of housework out of the home by the establishment of washing centers. Housewives can now have laundry done by mechanical washers expertly managed outside the home for a quarter. Deep freeze and frozen locker establishments have long passed the experimental stage and will further change the pattern of modern urban life. There are countless other ideas farther along than most people realize.

The gradually shrinking working day will call up new demands on all the service industries for the extended facilities required for recreation and leisure.

All of these factors in our expanding economy involve stupendous capital funds. Even a cursory view

of the new horizon in our own country for the next decade, completely shatters any theory of maturity or satiety in our economic development. The demands for capital in the United States for every segment of our economy will be active and continuous, if we contrive to meet the opportunities for a creative, dynamic and prosperous decade.

Our Latin Neighbors

The capital famine abroad is more acute but it is of vital economic concern to the United States. We have the formidable task of remaining prosperous. The rest of the world has the prodigious task of approaching prosperity. The lowest standards of living in America would constitute undreamed opulence in many countries elsewhere.

Notwithstanding the wide difference in the political systems they each espouse, communists, socialists and capitalists are on common ground in agreeing that capital investment is the only real means of economic progress. None of the nations outside the United States has been able to accumulate sufficient capital to meet the urgent demand.

In our own hemisphere, there is not a country in Central or South America that is not hard pressed for investment capital. Some few of them have been progressive enough to initiate methods of partially satisfying the demand that would have been considered highly unorthodox in another age. But the need for capital is so great that some of these nations were obliged to experiment with new techniques. Their successful operation is their best testimonial.

For example, the Government of Chile utilized the framework of an organization originally set up to repair the damage of devastating earthquake. The Corporacion De Fomento De La Produccion is now an established government enterprise. It has a realistic plan for economic development and is procuring the required capital abroad for the launching and sustenance of new industries and services included in the long range plans. It attracts private investors in its own country. The Fomento carries its investment only so long as necessary; for when the newly organized company has proven successful through actual operations, and a demand is created for its capital, Fomento disposes of its holdings in the market. It uses the funds so procured to move on to new developments and industries. The Chilean government has created a "Realiza-

tion Fund", constituted by the collection of certain taxes allocated to the Fomento. To have waited until such taxes had built up an adequate fund to undertake the planned programs would have taken years and would have meant the indefinite deferral of even an approach to economic stability. The Export Import Bank of the United States has a sound investment in Chile through the government-owned Fomento there.

The needs for capital in every Central and South American Republic parallel those of Chile. The methods adopted for meeting those needs are as different as the countries themselves, but the basic purposes are identical and the benefits of the first effects on their and our own prosperity are already evident.

Look to the Orient

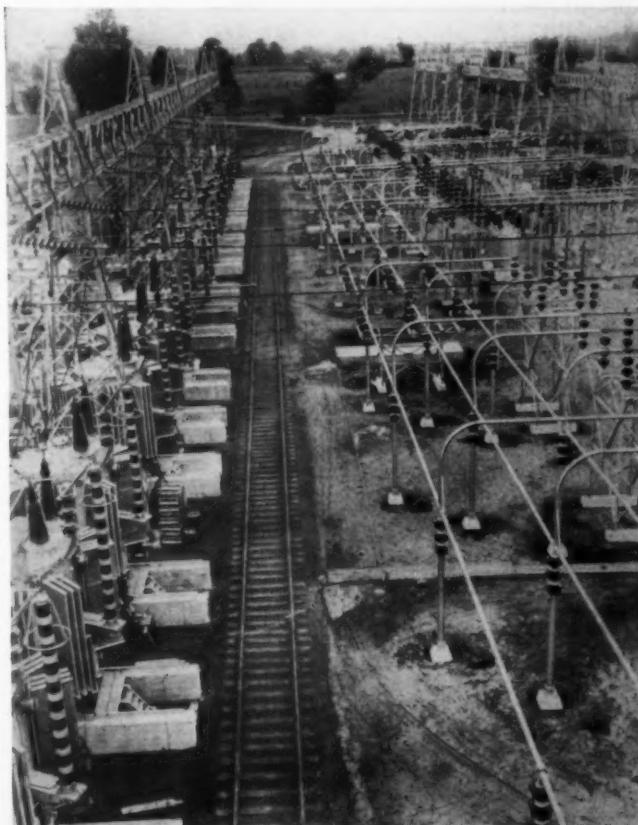
The demand for capital in Asia reaches staggering proportions. It always has. All of us remember the truism, that if we could put an American oil lamp in every tenth hut in China, or add a half inch to every Chinaman's shirt, our glass and textile industries would be glutted with business for ten years. We can no longer be facetious about China nor Asia. Instead of oil lamps and lengthened shirt-tails we shall

have to think about power plants, coal mines, cement plants, steel mills, agricultural machinery, rail and water transportation — a whole catalogue of productive equipment and the investment capital involved. For China and most of Asia have been aroused from lethargy and now emerge as consumers of food stuffs, durable goods, and importers of capital on a gigantic scale. The industrial development of that huge portion of the world with its teeming millions is a vital part of the world's economy and has direct influence on the United States.

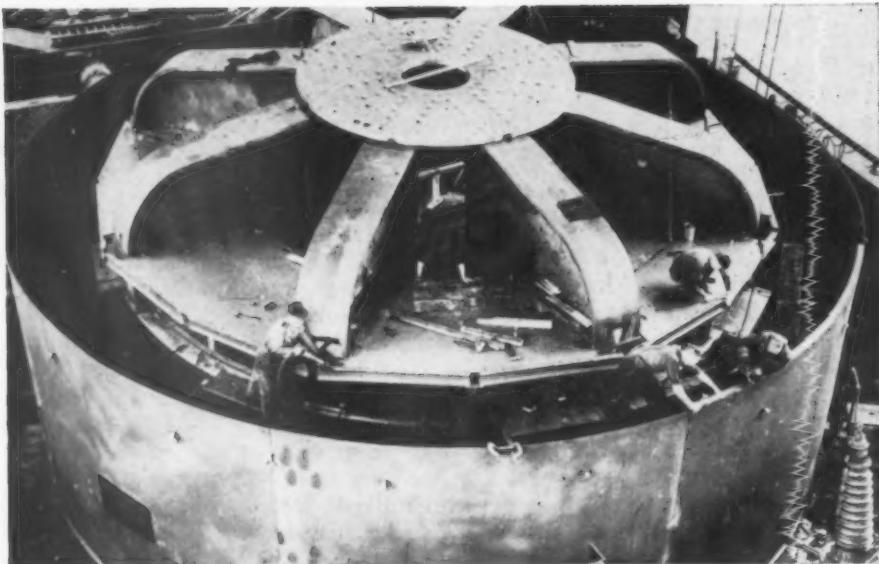
India is now the seventh greatest steel producer and the ninth ranking industrial nation of the world. The rapid further development of that nation makes it the greatest prospective customer for goods, services and capital in all Asia for the next decade, and possibly longer. The economic and political problems that have plagued India for centuries are being partially solved in practice today. The continuing industrialization will create a further demand for outside capital that will tap every source.

The Need in Europe

The European situation is perhaps better, but still not well enough known to many Americans. Great Britain



The start of power transmission from the Bonneville Dam on the Columbia River east of Portland, Oregon—an \$85,000,000 project developed in the realization that adequate supplies of power are essential to production and high living standards.



The importance of capital investment for industrial development can be visualized in this electrical generating unit built by General Electric Company for use at Boulder Dam.

must relieve her capital famine quickly if she is to survive economically. The purposes of her capital investments are to increase industrial production and to return her people to their living standards of 1938 at least. It is a colossal task, and in order to undertake it the United Kingdom will be obliged to seek foreign capital for at least another decade.

France has already started the new foundations for a widely expanded economy. The Monnet Plan includes such basic industries as coal, power, steel, cement, agricultural machinery, and transport in all categories.

Belgium, Netherlands, Luxembourg, the Scandinavian Countries — in short, all of Europe is suffering from a capital famine and is desperately calling for vast sums. These demands for capital must be met if Europe is to succeed in restoring itself.

The Marshall Plan, now the European Cooperation Administration, even under the most optimistic view of its efficiency through 1951, can be but a first step in the hard journey toward economic recovery. If the Western European nations succeed in working out a coalition in their own common interests, we can look to an industrial development in Europe on a scale surpassing anything known before in history.

Only Our Source of Funds

It should be convincingly clear that the deficit of capital in the world is of almost incalculable proportions. Any estimate would be astronomi-

cal, and would be meaningless without reasonably detailed analysis country by country. The fact is that there is a worldwide determination to increase the productive potential of peoples as the first imperative step toward achieving economic health. It can only be accomplished by capital investment.

There can be little doubt that the nations of the world will be obliged to follow the traditional method of procuring capital by outside borrowing. There is not much speculation as to the origin of such capital or funds. The United States is the only nation where the available money in sufficient quantity is either privately or publicly owned.

The major part of capital lent will undoubtedly be from government to government, or from international agencies to recipient governments. It is questionable whether private financing will be on any measurable scale until the vexing and often explosive political questions are answered. Any country, government, or people which cannot or will not meet reasonable requirements for the safety, proper use, and reimbursement of borrowed capital is automatically excluded from this study.

The machinery for the flow of capital already exists and is functioning in the United States. The International Bank for Reconstruction and Development is the parent organization, implemented by the International Monetary Fund, the International Food and Agriculture Organization, the International

Trade Organization, and others.

It has been necessary to exclude the Soviet Union and the countries under its domination from the area of industrial reconstruction and expansion in this discussion. There is an accumulation of evidence that the Soviet, far from cooperating in this urgent business, even in its own interest, will do everything possible to oppose and frustrate it. Their methods of raising necessary capital for their own industrial development are repellent to all Americans. Aside from the purely humanitarian aspects, their ruthless system of wringing capital out of an already disadvantaged people is economically unsound and requires energy and force that must sap the productive strength of any nation.

The force of circumstances makes it necessary for the Western Nations to work *without* Russia, but that does not mean that we shall be distracted from the main task by working *against* Russia.

It is conceivable that the Eastern European nations now controlled by Russia will throw off the Soviet yoke when they realize that their Western neighbors are on the road to prosperity while the satellite nations pay ransom to a brutal and unworthy master.

The questions of "socialism" and "nationalization of services and industries" can be solved by international agreement, compromise and adjustment, without foregoing democratic principles. Undoubtedly there are highly complicated issues but they are by no means insoluble.

Call to Leadership

Nothing in this brief survey is intended to convey the thought that capital investment is a panacea that will dose an ailing world back to economical health. Leadership, courage, confidence and cooperation are essential.

Whether or not we wished it, the United States is now the world's creditor nation. That position offers us an opportunity to take full and honorable advantage of world leadership. American genius in all fields and at all levels will be needed, without stint, if world economic stabilization is to be achieved. Without it there can be no semblance of peace or prosperity anywhere. Economic stability requires capital to fertilize, nurture, and bring it to fruition. America has the means, the genius and the will. If these are applied with characteristic American vigor, there will be good times ahead.

Where We Stand

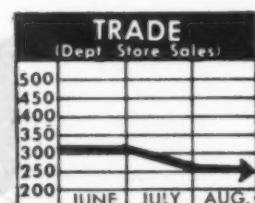


Today's Business Trends As Reported In Current Statistics

	BASE	LATEST	MONTH AGO	YEAR AGO	% OF CHANGE IN MONTH	% OF CHANGE IN YEAR
Industrial Production Index	1935-39=100	191 (est.)	192	176	— 0.5	+ 8.5
Steel Production (Weekly)	000 net tons	1,711	1,673	1,631	+ 2.3	+ 4.9
Electric Power Production	mil KWH	5,319	5,166	4,874	+ 0.2	+ 9.1
Bituminous Coal Production	000 net tons	12,150	3,460	11,798	—	+ 3.0
Auto, Truck & Bus Output	units	108,948	108,081	78,105	+ 0.8	+39.5
Petroleum Output	000 bbls	5,505	5,484	5,105	+ 0.3	+ 7.8
Engineering Construction	000 \$	151,361	154,193	100,692	— 1.8	+50.3



All Commodities (Bur. Labor Statistics)	1926=100	168.3	166.7	151.3	+ 1.0	+11.2
Semi-Manufactured Articles	1926=100	152.9	154.0	147.2	— 0.7	+ 3.9
Raw Materials	1926=100	183.4	184.3	165.6	— 0.5	+10.7
Manufactured Products	1926=100	164.1	160.9	146.0	+ 2.0	+12.4
Steel Billets, Pittsburgh	gross ton	\$58.24	\$50.00	\$45.00	+16.5	+29.4
Steel Scrap, hvy, Pitts., del.	ton	47.50	45.00	44.50	+ 5.5	+ 6.7
Copper (Electrolytic)	lb.	.23 1/2	.21 1/2	.21 1/2	+ 9.3	—
Cotton, mid., 15/16"	lb.	.3243	.3548	.3495	— 8.6	— 5.2
Rubber, (Rib-smoked sheets)	lb.	.24 1/2	.24	.15 1/8	+ 2.0	+60.0
Wheat (No. 2)	bu.	2.40 1/8	2.49	2.48 1/4	— 2.2	— 2.1



Dept. Store Sales Index (Fed. Res.)	1935-39=100	258	264	223	— 1.2	+15.7
Commercial Failures (Dun & Bradstreet)	no.	116	103	60	+12.6	+93.3
Freight Carloadings	cars	878,901	888,582	905,244	— 1.1	— 2.9

FINANCE

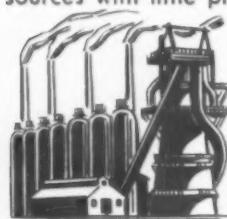
Stock Prices (Standard & Poor's)	1926=100	124.8	133.5	122.5	— 6.5	+ 1.9
Bank Clearings (New York) —	mil \$	6,504	6,264	6,175	+ 3.8	+ 5.3
Federal Reserve Credit	mil \$	22,064	22,243	22,494	— 0.8	— 1.9
Currency In Circulation	mil \$	27,966	28,142	28,223	— 0.6	— 0.9

Materials & Markets

Materials & Markets

NON-FERROUS METALS

With all major producers having joined in raising the price of copper from 21 1/2c to 23 1/2c a pound after a year's efforts to keep it down, it now appears that the higher level will be maintained for some time to come. A high rate of demand continues from three sources with little prospect of diminution: the national defense stockpiling program, the European Recovery Plan, and domestic manufacturers. One trade leader has already warned the Munitions Board that large quantities of refined copper can be stockpiled only at the cost of increased prices or curtailed civilian use. He pointed out that despite high domestic output, 40,000 tons a year of duty-free copper have been necessary to meet requirements here.



An acute shortage of lead continues, with the three above-mentioned factors playing an equally important part here. Government pressure for stockpiling, foreign demand, and high domestic consumption are expected to keep the market quite tight for many months.

Demand is so great, however, that imported lead, at 2 1/2c above the domestic market, is being sold readily in this country.

Shortage of cheap power continues to harass aluminum producers, and despite record production the pinch in available aluminum is becoming greater. The Aluminum Association has estimated that although production is at the rate of about 1,300,000,000 pounds a year, it is at least 500,000 pounds short of this year's civilian demand. Continued discovery of new uses for the metal will tend to push that shortage figure higher and higher unless production is stepped up considerably. Expanding military requirements are also biting into present supply. When and if that necessary power will be available, however, is a question that neither government nor industry seems yet in a position to answer.

FUELS

Increased production, better transportation facilities and the changeover of the United States to a net oil-importing country have improved the situation to a point where leading trade authorities state the "oil shortage" is over, and adequate quantities will be



available to users of petroleum products during the coming winter. American Petroleum Institute figures recently showed that supplies in storage of kerosene and light and heavy fuel oils were 27,600,000 barrels greater than a year ago, gasoline stocks were about 12,200,000 barrels larger, and domestic crude oil production was averaging about 8% higher than last year. The pipe-line capacity of the country is greater than it was a year ago, and the shortage of tankers that plagued producers and consumers during the winter of 1947-48 no longer exists.

The turnaround in the export-import situation, while temporarily helpful, has, however, led one industry expert to predict that unless Middle East oil field transportation problems are solved this country will have gasoline rationing in 1951. He said that given the pipe they require, the four leading companies producing Middle East oil can help prevent an "oil famine" for years to come, regardless of the increasing demands of the recovering European nations and the rest of the world.

Announcing the end of quantitative allocations of United States coal for overseas export as of September 1, Commerce Department officials said that prospects are favorable that this country's mines will be able to produce in the coming months enough coal of all types for both domestic and foreign customers, particularly since overseas demand for American coal has greatly declined.

STEEL

Despite record production by the steel industry, consumers can hope for little improvement in the supply situation as the dislocations caused by the switch to f.o.b. pricing begin to take full effect, and the prospects of expanding allocations restricting the amount available for commercial purposes increase. The abandonment of the basing-point system is said to have already tightened the supply situation in those areas at great distances from the mills and revived the gray market.

The scrap shortage continues to be a major problem, but reports of large tonnage being in the process of allocation from Germany to United States have aroused some optimism in the domestic market.

MANUFACTURERS' SALES, INVENTORIES AND NEW ORDERS

Indexes of Value of Manufacturers' Sales (Average Month 1939=100)

Total Manufacturing.....	295	311	331	332	324	324	344
Durable Goods.....	328	329	359	365	352	350	385
Iron, Steel & Prod.....	306	325	336	345	325	340	354
Non-Ferrous Metals and products.....	376	364	415	410	415	419	...
Electrical Machinery and Equipment.....	394	386	446	442	440	431	...
Machinery, exc. elec.....	339	304	356	363	350	354	...
Automobiles & Equip.....	364	383	424	435	413	382	...
Transportation equip. except autos.....	508	442	469	501	476	467	...
Furniture and finished lumber products.....	208	270	308	273	256	248	...
Stone, clay & glass products.....	244	223	222	252	274	269	...
Other durable goods.....	269	276	277	271	255	263	...
Nondurable goods.....	276	301	314	306	307	308	323
Food & Kindred prod.....	286	313	305	297	299	303	...
Textile-mill products (exc. apparel).....	279	301	350	345	333	326	...
Leather & products.....	222	303	327	300	266	232	...
Paper & allied prod.....	315	320	334	333	332	344	...
Chemicals & allied prod.....	304	320	327	315	334	327	...
Petroleum & coal prod.....	254	328	336	322	318	335	...
Rubber products.....	322	282	289	252	312	344	...
Other nondurable goods.....	257	296	329	341	326	313	...

Indexes of Book Value of Manufacturers' Inventories (Average Month 1939=100)

Total Manufacturing.....	246	265	268	271	271	274	278
Durable Goods.....	266	279	280	281	284	285	286
Iron, Steel & Products.....	192	202	205	205	206	213	...
Nonferrous metals & products.....	253	249	250	257	262	263	...
Electrical mach. & equip.....	374	372	376	384	388	395	...
Machinery, except elec.....	271	291	293	295	297	295	...
Automobiles & equipment.....	443	462	472	473	472	475	...
Transportation equipment, except autos.....	630	628	627	619	626	631	...
Furniture & finished lumber products.....	212	241	234	242	255	259	...
Stone, clay & glass products.....	161	168	163	165	163	159	...
Other durable goods.....	191	218	213	202	204	192	...
Nondurable goods.....	230	254	257	262	261	265	271
Food & kindred products.....	194	255	244	243	236	230	...
Textile Mill products (excl. apparel).....	221	238	249	255	253	256	...
Leather & products.....	208	229	238	241	241	254	...
Paper & allied products.....	229	268	272	276	276	287	...
Chemicals & allied products.....	265	273	279	289	285	287	...
Petroleum & coal products.....	162	177	178	182	186	197	...
Rubber products.....	277	271	283	302	293	302	...
Other nondurable goods.....	293	301	319	329	332	345	...

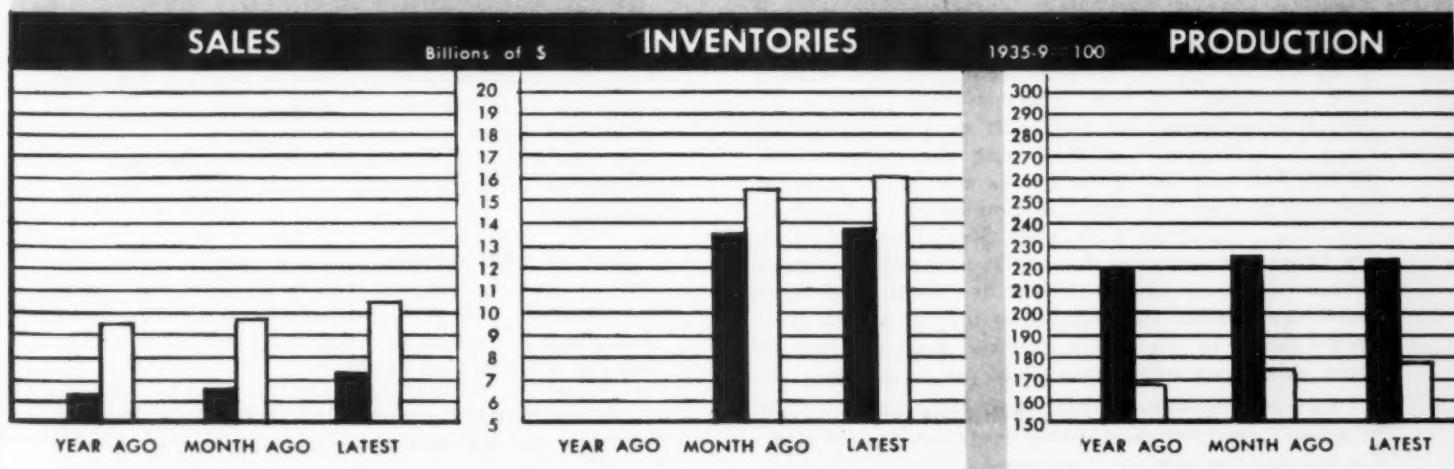
Indexes of Manufacturers' New Orders (Average Month 1939=100)

All Industries.....	...	251	251	257	252	243	260
Durable Goods.....	...	291	287	314	292	266	309
Nondurable goods.....	...	227	229	223	228	230	235

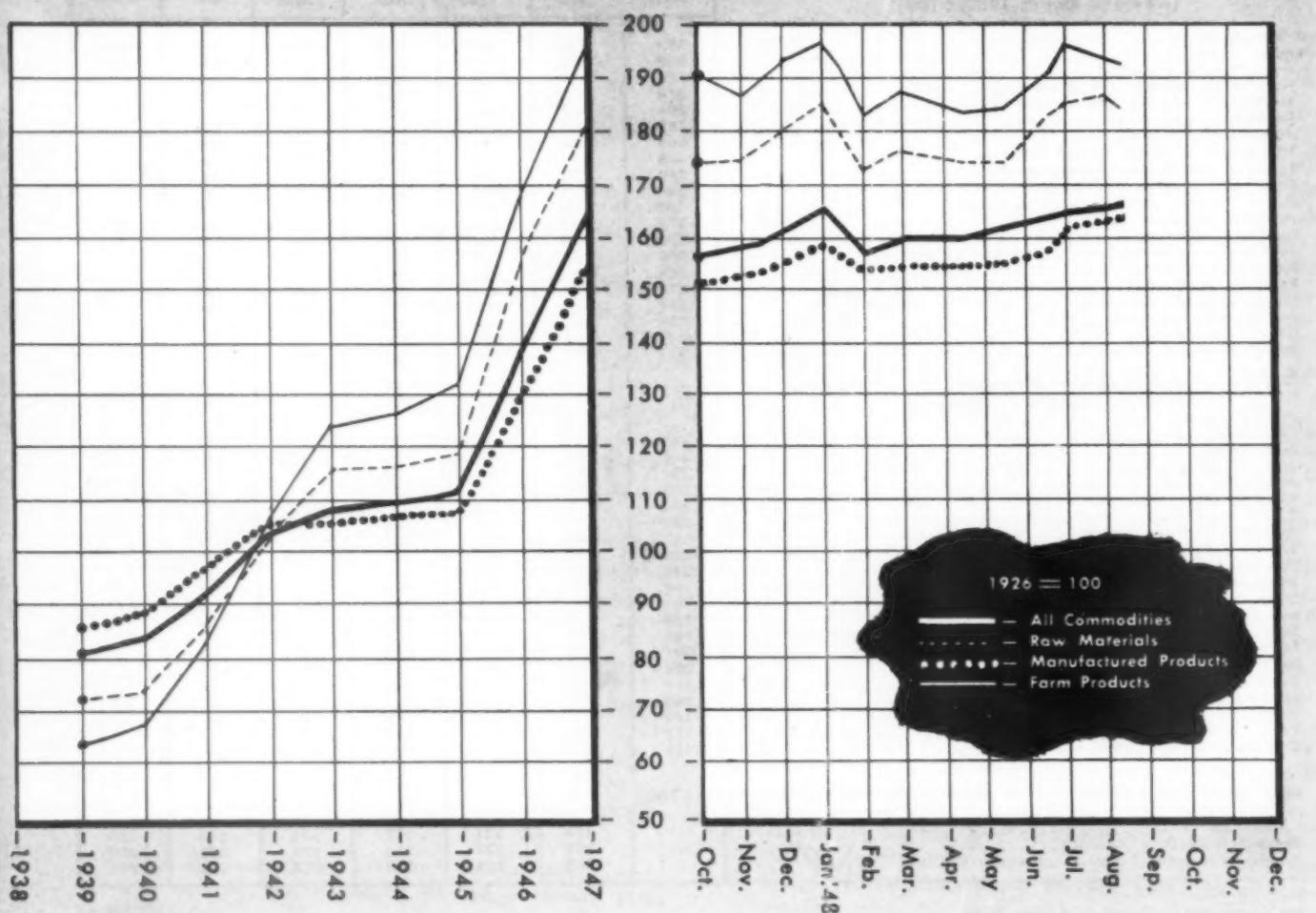
*Estimated

Source — Department of Commerce, Revised Series

SALES, INVENTORIES AND INDUSTRIAL PRODUCTION



The Price Picture



Straws in the Trade Wind

Steel production during the first six months of 1948 was higher than ever before in peacetime . . . More than 43,000,000 tons of steel were produced, despite the interruption of coal supply in March and April, which is estimated to have cost another 1,600,000 tons . . . Shipments of steel pipe and tubes totaled 3,302,748 tons during the first six months, an increase of 10.7% over the record shipments of the first half of 1947 . . . Jones & Laughlin Steel Corp. has sold its 25-acre McKeesport, Pa., works to the Kelsey-Hayes Wheel Corp., of Detroit. It was described as the first move by a major steel fabricator toward setting up a plant closer to the source of basic steel in order to take advantage of the new f.o.b. pricing system.

Kennco Explorations, Ltd., subsidiary of Kennecott Copper Corp., will develop the large deposits of high-grade titanium ore just discovered in Eastern Quebec, according to Canadian officials.

Announcement by General Clay that we will assist manufacturers to make it possible for them to reopen their aluminum-processing plants in Western Germany indicates that country will once again become one of Europe's most important consumers for raw aluminum and bauxite. All restrictions as far as aluminum production is concerned have been lifted in Western Germany.

Due to the shortage in coking coals vital to iron and steel production, the Bureau of Mines has begun a nationwide survey of minable coking coals to serve as a guide in developing adequate reserves for use in times of national emergency.

Senator Homer Capehart (Rep., Ind.) has announced plans for an advisory committee to assist a special Senate committee in investigating the effect of the Supreme Court's decision against basing point pricing.

Margin and Mark-up at a Glance

This handy chart gives the relationship between cost, selling price, mark-up, and margin

• By W. F. Schaphorst

HERE is so much confusion in the minds of readers concerning the true relationship between cost, selling price, mark-up, and margin, that the writer decided to prepare a chart on the subject. So, here is the chart.

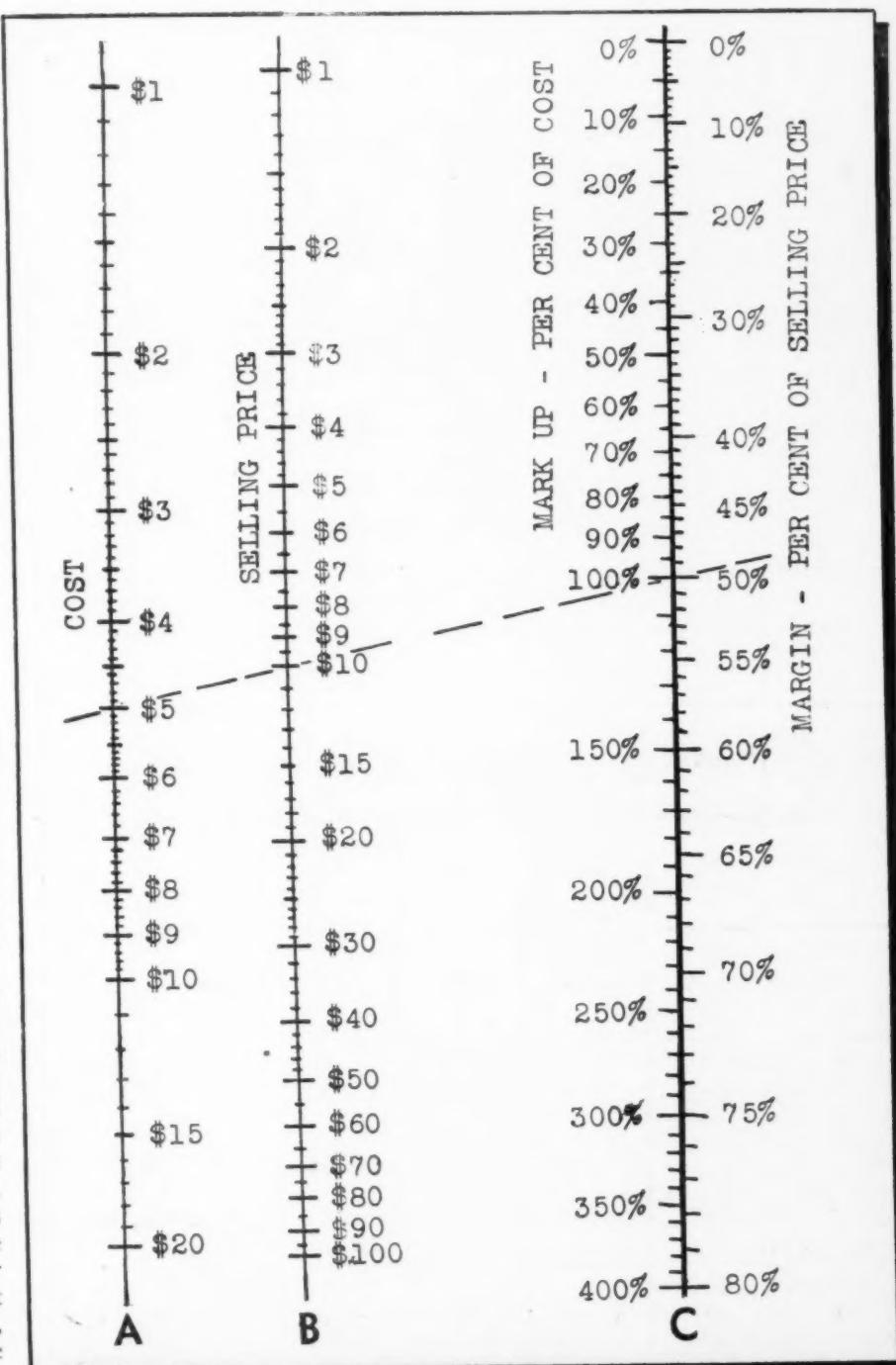
This handy chart, as will be noted, does your figuring for you so that it will not be necessary to use a pencil.

For example, if the cost of a given article is \$5 and you sell it for \$10, what is the mark-up, and what is the margin?

The single dotted line drawn across the chart solves the problem instantly. The line passes through the \$5, column A, and through the \$10, column B, which are the Cost and Selling Price respectively. The intersection of the dotted line with column C gives the answers, showing that the mark-up is 100 per cent, and the margin is 50 per cent.

Column C, in itself, gives the relationship between Mark-up and Margin. Thus for instance if the mark-up is 25%, what is the margin? Find the 25% on the left-hand side of column C and glance across to the right-hand side and it will be found that the margin is 20%. Again, if the mark-up is 400% the margin is 80%. And so on. As will be noted the mark-up varies all the way from 0% to 80%.

The chart is also applicable to larger or smaller amounts. It has no limit. Thus if the cost is \$50 and the selling price is \$100, the same dotted line gives the answers as 100% and 50% respectively, just as before. In other words, you merely add ciphers to the figures in columns A and B. The only rule to remember is that as many ciphers must be added to the figure in column B as in column A, or vice versa. Or, likewise, if the cost is 50¢ and the selling price is \$1, the same dotted line, again, gives the selfsame answers in column C.



You Can't Buy Die Castings By The Pound

By James L. Erickson •

Old rule-of-thumb methods for estimating and pricing die cast parts have given way to modern cost accounting. Here's why.

ONCE upon a time, long, long ago, die castings were sold by the pound. Salesmen selling die castings practiced the ancient art of pricing their castings like so much cottage cheese—by the pound. In response to almost any casting buyer's query "How much will it cost?", the salesman would retaliate with: "How much will the part weigh?"

History has proved that selling die castings for so much per pound is sheer folly on the part of the die caster. To begin with, such pricing cheats the customer. Secondly, it all too often jeopardizes the die caster's own chances of realizing a legitimate return for his know-how and skillful efforts—as many a customer and die caster have learned too late!

The contemporary die caster never sells his wares on a pound basis; he does, however, sell his product at a considered price per casting, for in doing so he avoids the pitfalls that await those who rashly anticipate their costs.

This article is devoted to illustrating the folly of "so-much-per-pound" selling practice and to revealing how caution is exercised today by your die caster in preparing the price proposal he submits to you.

Many factors have a bearing on the cost of producing die cast parts—of which the raw material, or casting alloy, is but one. To overlook the manufacturing burden and the selling expense would be committing financial suicide—even the early die casters knew this and invented a *factor* figure to take care of these latter two costs. It was their opinion that a *factor* of so-much-per-pound could be used to successfully cost estimate all types of jobs. For example, a casting weighing x pounds was priced at: the *factor*, f , times x , or at a price of fx dollars. The *factor*, f , did away with the need for keeping any accurate cost accounting system! It worked fine. The majority of the die casters employed it—but somewhat unfortunately for many, if worked only with varying degrees of success!

It wasn't long however before it became obvious to most of the alert members of the industry that the *factor* pricing system was extremely limited in its application to the die caster's real cost estimating problems and subsequently they instigated the forerunner of the modern cost accounting systems employed throughout the entire industry today.

The *factor* system functioned perfectly when competition was less keen than it is today. The early die caster

*Figured by the method illustrated in Table No. 3.

Table No. 1
FACTOR SYSTEM PRICES COMPARED TO
THE MODERN ESTIMATING SYSTEM

Part Letter	Part Wt. Lbs.	FACTORS				
		40¢/lb.	50¢/lb.	60¢/lb.	70¢/lb.	Actual Cost*
A	.2300	.0920	.1150	.1380	.1610	.0794
B	.2309	.0924	.1154	.1385	.1616	.0902
C	.2318	.0927	.1159	.1390	.1622	.1162
D	.2318	.0927	.1159	.1390	.1622	.1013
E	.2327	.0931	.1164	.1396	.1628	.1252
F	.2336	.0934	.1168	.1401	.1635	.1443

merely chose a *factor* large enough to cover the cost of die casting, at slow speed, the most complex of part designs utilizing the most superior grade of alloy, and the highest priced labor! Worked this way, the *factor* system couldn't fail—it didn't fail! It guaranteed a profit on the tough jobs and *even more* profit on the easy ones!

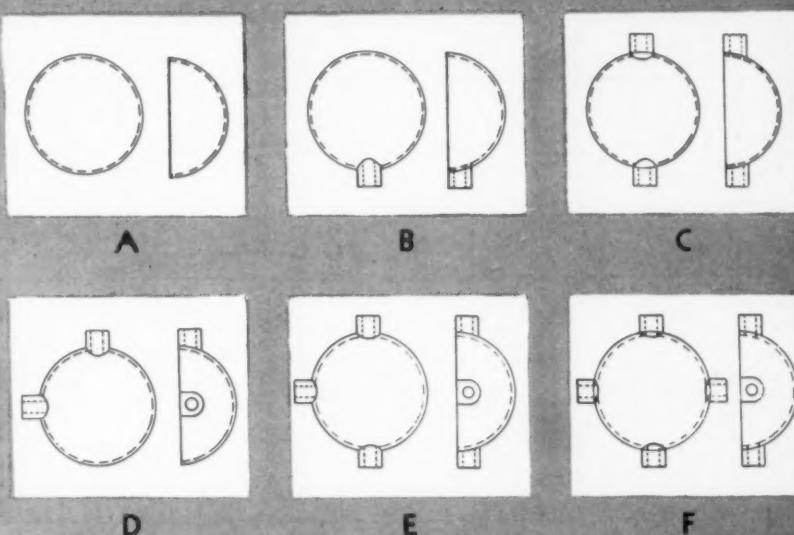
As competition became a little more rugged, the die casters discarded the *factor* system in favor of one which permitted a closer estimation of each individual job.

The *factor* system was doomed to eventual extinction because it did not take the nature of the die casting process into consideration, viz., it did not take the number of cores required to produce a given part into account. It priced all castings of identical weight the same. Thus a particular part which could be cast by a die casting die without sliding cores was priced the same as a part of equal weight which could only be cast by a die casting die having four sliding cores, 90° apart.

Let us ascertain why *factor* pricing gives a false cost picture. Suppose a die caster, possessing only cold chamber type die casting machines, is invited to bid on the cost of die casting six different aluminum parts of similar hemispherical design and approximately equal weight, with their only difference the number and arrangement of cored bosses on their periphery (see Figure 1). Part A has no cored bosses and weighs .2300 pounds. Part B has one cored boss and weighs .2309 pounds. Part C has two cored bosses 180° apart and weighs .2318 pounds. Part D has two cored bosses 90° apart and weighs the same as Part C. Part E has three cored bosses 90° apart and weighs .2327 pounds. Part F has four cored bosses 90° apart and weighs .2336 pounds. The largest weight difference is between Part A and Part F: .2336-.2300, or .0036 pounds. Table 1 gives the cost of these five parts figured by the *factor* system using four different factors: 40¢, 50¢, 60¢, and 70¢ per lb. This table shows that the part price of Part A, using any of the four *factors*, does not differ greatly from that of any of the other parts when figured by the same factor. The individual piece price of each of the parts as figured by the "so-much-per-pound" method all come to similar values.

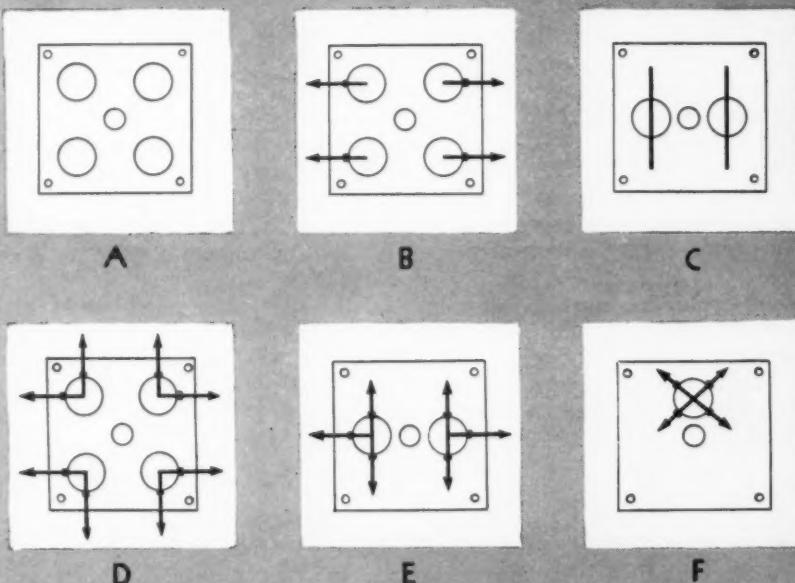
When the cost of these parts is calculated by the modern cost estimation procedure, the results are incongruous with those given in Table 1; nevertheless, these figures prove to

FIGURE 1



Shown in this figure are six individual die cast parts which differ only in respect to the number and location of cored bosses on the periphery of the hemispherical shape. The dimensions of all the hemispheres are identical, as are the dimensions of the cored bosses.

FIGURE 2



Shown in this figure are six possible die layouts for the six parts A, B, C, D, E, and F and their slide core movements indicated by the arrows. Maximum overall die size has been used in each case merely for simplification. The number of any one type of part which can be put in one die is determined in part by the number of sliding cores, their respective direction of withdrawal, and the fact that sliding core mechanisms must not conflict.

Table No. 2

COMPARISON OF THE FACTOR AND THE MODERN ESTIMATING SYSTEM

Column	1	2	3	4	5	6	7	8	9
Part	Piece Price*	Gross Sales Per Hour	Profit Per Hour	Piece Price**	Gross Sales Per Hour	Profit or Loss Per Hour	Piece Price***	Gross Sales Per Hour	Profit or Loss Per Hour
A	\$0.0794	\$46.00	\$4.60	\$0.0920	\$53.36	+\$11.96	\$0.1610	\$93.38	\$51.98
B	0.0902	50.00	5.00	0.0924	51.74	+\$ 6.74	0.1616	90.60	45.60
C	0.1162	33.70	3.37	0.0927	26.88	-\$ 3.45	0.1622	47.04	6.71
D	0.1013	55.90	5.59	0.0927	51.17	-\$ 0.14	0.1622	84.67	33.36
E	0.1252	35.50	3.55	0.0931	26.44	-\$ 5.51	— 5.51	46.24	16.29
F	0.1443	21.66	2.17	0.0934	14.01	-\$ 5.48	0.1635	24.52	5.03

*Figured by method shown in Table No. 3.

**Using a factor of 40¢/lb.

***Using a factor of 70¢/lb.

be somewhat more trustworthy.

The modern cost estimating system sets a selling price of \$0.0794 for Part A, while the cost of producing Part F is set at \$0.1443, or a difference of \$0.0649 between Part A and Part F, as opposed to a difference of only \$0.0014 when figured by the 40¢ per lb. *factor* system of pricing.

Obviously if the Part F actually will cost \$0.1443 to produce and sell with a minimum of 10% allowed for profit, the correct *factor* to arrive at this correct price would have to be \$0.1443 ÷ .2336, or \$0.62 per lb. But if \$0.62 per lb. had been used as the *factor* to arrive at the cost of Part A, the piece price of Part A would have come to \$0.62 x .2300, or \$0.1426, a selling price actually \$0.0632 too high—unless of course competition is to be nil.

On the other hand, if Part A can actually be made for \$0.0794, this means that to arrive at this figure by the *factor* system, the *factor* would have to be \$0.0794 ÷ .2300, or \$0.345 per pound. In retrospect, if this *factor* had been used to ascertain the selling cost of Part F, its selling price would have come to \$0.345 x

.2336, or \$0.0806—a price calculated to help the die caster lose his shirt!

Table No. 2 illustrates what a die caster may expect if he employs the *factor* system instead of the modern cost estimating technique. Column 1 gives the piece prices for Parts A, B, C, D, E, and F as figured by the modern cost estimating system. Column 2 gives the gross sales realizable by the die caster per hour if he operates his machine at the rates given in Table 3. The profit the die caster will realize per hour is given in Column 3.

If the die caster takes on the die casting of the Parts A, B, C, D, E, and F at prices figured on the basis of 40¢/lb., the profit or loss which the die caster stands to realize is given in Column 6. Obviously the *factor* system only works well in the case of Part B, see Table No. 1. For in the case of Part A, this bid will turn out to be too high when compared with a competitor's bid figured by the proper technique. The *factor* system does not work for Parts C, D, E, or F, for in these cases if the die caster submitted these prices and was awarded the jobs, he would end by losing instead of making money.

Then again, if a die caster employs a *factor* of 70¢/lb., his piece prices would come out as per Column 7, Table No. 2. A *factor* of 70¢/lb. sets prices for the Parts A, B, D, and E which are absurdly high when considered in the light of competition. It is obvious from an inspection of Table No. 1 that in order to arrive at correct and reasonable piece prices for the Parts A, B, C, D, E, and F, four different *factors* have to be employed.

It appears then, that no single *factor* will work for all types of castings, and that therefore if the *factor* system is to work at all it depends upon a different factor for each new part to be priced!

Now let us learn why the cost of Parts A, B, C, D, E, and F differ when calculated by the modern cost estimating system which does take into account the various advantages and limitations of the die casting process. Table No. 3 details the various points to be covered herewith.

I. NUMBER OF PARTS PER DIE

The number of parts a die caster can cast in one "shot" of his die casting machine is determined by the

number of separate "part" cavities in the die casting die. Single cavity die casting dies produce one part per shot; multiple cavity dies produce two or more parts. The number of part cavities that can be put in one die casting die and still have the die operate successfully depends upon several factors:

1. *The weight of the part to be cast*—all die casting machines have a weight capacity which cannot be exceeded. In many instances, all other factors being favorable, the factor limiting the number of cavities is the weight factor. For example, if the die casting machines of a given die caster cannot cast over 2 lbs. per shot, not including runner and butt weight, the die caster is limited to employing a five cavity die casting die when the part to be die cast weighs 0.25 lbs.

2. *The surface area of the casting*—die casting machines are all host to a maximum locking force, which when exceeded in value by the force of the molten metal within the die which tends to force the die apart, permits the escape of molten metal, which is within the die cavity, with dangerous consequences to the operator of the die casting machine. Such "spitting" also throws "off" the dimensions of the casting perpendicular to the faces of the die. This situation has the effect of limiting the number of parts a die caster can make in one die casting die, especially if the part is flat.

3. *The overall size of the castings*—while a casting may not be of excessive weight, or of excessive surface area parallel to the die parting plane, it may be of such an overall size as to limit the number which can be put into a single die casting die. A typical example is that of die cast picture frames.

4. *The number, size, and shape of holes to be cored, and their relation to one another, and their relation to the plane of die parting.* Parts which call for cores whose depth is normal to the plane of die parting are the only exception to this rule. Parts which have holes to be cored whose depth lies parallel to the plane of die parting call for dies having sliding core pulling mechanisms. Such core pulling mechanisms take up space within the die casting die and thereby limit the number of parts which can be made in one die casting die. Parts which call for dies which do not need sliding cores can generally be set side by side in one die casting die; however, when the parts call for dies which do need sliding cores, the parts have to be positioned in the die casting die leaving space for the core

Table No. 3
MODERN COST ESTIMATING SYSTEM APPLIED
TO PARTS A, B, C, D, E, AND F

	PARTS					
	A	B	C	D	E	F
No. of Cores Per Part	0	1	2	2	3	4
No. of Parts Per Die	4	4	2	4	2	1
Est. Shots Per Hour	145	140	145	138	142	150
Est. No. of Parts Per Hour	580	560	290	552	284	150
Part Weight	.2300	.2309	.2318	.2318	.2327	.2336
Shot Weight	1.87	1.88	1.12	1.82	1.13	0.76
Die Life in "Shots"	50,000	50,000	50,000	50,000	50,000	50,000
Die Life in Parts	200,000	200,000	100,000	200,000	100,000	50,000
Initial Die Cost	\$1,200	\$1,800	\$1,300	\$2,100	\$1,500	\$1,100
Die Cost Per Part	\$0.0060	\$0.0090	\$0.0130	\$0.0105	\$0.0150	\$0.0220
Metal Cost Per Part	\$0.0414	\$0.0416	\$0.0417	\$0.0417	\$0.0419	\$0.0420
Overhead Per Part	0.0060	0.0062	0.0120	0.0063	0.0123	0.0233
Casting Per Part	0.0025	0.0027	0.0052	0.0027	0.0053	0.0087
Breaking Gates Per Part	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
Trimming Per Part	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024
Deburring Per Part	—	0.0024	0.0031	0.0031	0.0036	0.0040
Inspection Per Part	0.0040	0.0042	0.0042	0.0042	0.0046	0.0050
Die Maintenance Per Part	0.0050	0.0075	0.0125	0.0075	0.0175	0.0250
Reject Allowance Per Part	0.0029	0.0070	0.0074	0.0071	0.0091	0.0115
Packing and Shipping Per Part	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
Total Mfg. Cost Per Part	0.0722	0.0820	0.0965	0.0830	0.1047	0.1312
10% Profit Per Part	0.0072	0.0082	0.0097	0.0083	0.0105	0.0131
Selling Price Per Part	0.0794	0.0902	0.1162	0.1013	0.1252	0.1443

Note: (1) All labor figured at \$1.20 per hour.

(2) Overhead figured at \$3.50 per hour.

(3) Casting labor figured at \$1.50 per hour.

The reader must bear in mind that while the overall procedures set forth in this article for pricing die castings and pressure moldings are fairly indicative of those in universal use, the specific costs such as metal price per pound, direct labor, overhead, etc., are not indicative of any particular concern or locale—indeed, these specific costs vary widely from die caster to die caster and are dependent on a multiplicity of rather unrelated factors such as climate, transportation, labor unions, etc.

pulling mechanism (see Figure 2). The larger the diameter of the cored hole and the greater its depth, the greater is the die space which must be allotted for the core pulling mechanism.

Returning now to our Parts A, B, C, D, E, and F, we find that: (1) the weight of the parts permits, let us say, a maximum number of four parts per die, (2) the surface area is not large enough to rule out four parts per die, nor (3) is the overall size of the parts large enough to exclude four cavities of the parts in one die. The only characteristic of certain of the parts which prevents them from being cast with the aid of a four cavity die casting die, or even with the aid of a two cavity die casting die, is their coring requirements.

Part A, of course, has no cores and a four cavity die casting die is feasible.

Part B calls for only one sliding core in the die per part, and a four cavity die casting die is permissible in its case.

Part C calls for a die having two cores 180° apart which necessitates the employment of four sliding cores spaced as shown in Figure 2. A die casting die with only two cavities is possible in this instance because any further parts in the same die casting would make it impossible to pull the sliding cores as their respective movements would interfere with one another or would necessitate having a runner cross the moveable cores, which is inadvisable in die casting die design.

Part D calls for a die casting die with two sliding cores 90° apart, which permits the employment of a four cavity die casting because the sliding cores can be so positioned that their respective movements do not conflict.

Part E calls for a die casting die having three sliding cores 90° apart and for this reason it can only be made with the aid of a two cavity die casting die.

Part F cannot be made in a multiple cavity die at all, since its four slide cores rule out a multiple cavity die casting die. As will be demonstrated presently, the number of castings which a die caster can make per "shot" influences the cost of producing any given die cast part.

II. RATE OF PRODUCTION

The cost of die casting a specific part depends on the rate at which the part can be die cast. The reason for this becomes self-evident when one learns that most die casters charge off a portion of their overhead against

each operating hour of their die casting machines. Thus the larger the number of individual castings produced per hour per machine, the smaller is the portion of the overhead and direct casting labor which have to be distributed over the total number of parts die cast per hour. Multiple cavity die casting dies which are run at speeds equivalent to single cavity die casting dies produce more castings per hour; for example, if two dies ran at 100 shots per hour and the hourly burden is \$5.00, then in the case of the single cavity die the overhead cost per part is \$0.05, whereas in the case of a ten cavity die the overhead cost per part is $\$5.00 \div (10 \times 100)$, or \$0.005 per part.

As we note, the three main factors determining the value of the overhead and direct casting labor per part are: (1) the overhead and direct labor rates per hour, (2) the number of castings made per "shot", and (3) the casting cycle, or rate of "shots" per hour.

Not all dies can be operated at the same number of cycles per hour; certain variables and conditions pre-determine the casting cycle, viz., (1) the solidification time of the metal injected into the die casting die cavity; (2) the amount of attention the die casting die must receive per shot from the operator, e.g., cleaning the die, blowing off the flash, greasing the ejector pins, spraying on a die coat, if employed, etc.; (3) in the case of the cold chamber die casting machine especially, the rate at which the hand lading operation can be performed; and (4) the rate at which the casting can be removed from the die.

Two of these factors are mainly responsible for differences in the rate at which the various dies for producing the Parts A, B, C, D, E, and F can be operated, namely, the different pouring rates and the difference in the amount of time the operator has to devote each hour to cleaning and oiling the die (see Table No. 3).

The die casting die for Part A is estimated to operate at 145 shots per hour. The absence of any sliding cores makes it possible to run the die casting die for this part without having to clean or oil any sliding cores.

The die casting die for Part B is estimated to operate at 140 cycles per hour, or a little slower than the die for part A—in this case the pouring time is approximately equal to that for Part A; however, there are four sliding cores to lubricate and keep clean.

The die casting die for Part C also has four cores; however, its pouring rate is slightly less than the rate for

Parts A and B. This die casting die is estimated to operate at 145 shots per hour, or the same cycle as Part A.

The die casting die for Part D is estimated to operate at 138 shots per hour because of the inaccessibility of the sliding cores which must be kept free of flash. The rate of pouring for this part is identical with Parts A and B.

The estimated rate of operation for the die casting die for Part E is 142 cycles per hour, because it has two less sliding cores to keep clean and because it calls for less metal than Part B.

Part F's die casting die is estimated to operate at 150 shots per hour, because it requires only a short pouring time and because all cores are accessible to easy cleaning.

Thus, each hour, 580 Part A's can be cast, 560 Part B's, 290 Part C's, 552 Part D's, 284 Part E's, and 150 Part F's (see Table No. 3).

III. PART COST

The selling costs of the Parts A, B, C, D, E, and F are equal to the sum of: the metal required; the manufacturing burden and sales expense; the direct casting, finishing, inspecting, and shipping and packing labor; the allowance for rejections; the die maintenance; the selling commission, if any; and the profit. Occasionally die replacement is figured into the selling price, as in cases where the die caster guarantees to replace dies if any when this becomes necessary.

Table 3 illustrates how the selling prices of Parts A, B, C, D, E, and F are calculated by a simple version of the modern cost estimating system for die castings.

IV. THE FAILURE OF THE FACTOR

No single factor could be found which would give the die caster an intelligent selling price for the Parts A, B, C, D, E, and F. As has been shown, the factor that gives a sensible piece price for Part F gives a ridiculous piece price for Part A; that is, the use of the same factor prices Part A too high—a piece price that competition can beat. The factor that gives a reasonable piece price for Part A places too low a piece price on Part F—a price which if turned in by the die caster, would cost him his profit—and then some!

V. QUANTITY PRICE

The cost of the Parts A, B, C, D, E, and F in quantity are interesting, as indicated by Table No. 4.

The total cost of 10,000 Part A's, for example, is the sum of the initial

die cost, \$1,200, and the cost of 10,000 parts, or $10,000 \times \$0.0794$, or \$794.00 plus \$1,200, or \$1,994. Of course, even after these first 10,000 parts have been cast the die casting die is still good for another 190,000 parts!

The total cost of 10,000 Part F's is: \$1,100 plus $10,000 \times \$0.1443$, or \$1,100 plus \$1,443, or \$2,543; while the die casting die is good for only 40,000 more parts.

If 100,000 parts are wanted instead of 10,000, the total cost of the Part A's becomes \$1,200 plus \$7,940, or \$9,140; for the Part F's it is \$1,100 plus \$14,430 plus an additional die casting die of \$1,100, or \$16,630.

One million parts of A would cost \$79,400 plus the cost of five die casting dies, or \$79,400 plus \$6,000, or \$85,400; a million parts of F would cost \$144,300 plus 20 new die casting dies, or \$144,300 plus \$22,000, or \$166,300. Here the total cost difference amounts to: \$166,300-\$85,400, or \$80,900 for $4 \times 1,000,000$ cored bosses, or $\$80,900 \div 4,000,000$, or \$0.02 per cored hole!

The cost each of the cored holes in Part B when purchased in quantities of 1,000,000, is \$0.0069; the cost each of the cored holes in Part C when purchased in quantities of 1,000,000 comes to: \$0.0080; the cost of each cored hole in the cast of Part D comes to: \$0.0132; and finally, the cost of each cored hole in the Part E comes to: \$0.0137, see Table No. 5.

To pay \$0.0256 each for a single, simple, round hole is a lot of money; however, to pay \$0.0256 for a hole with a complicated shape, viz., square, hexagon, serrated, grooved, geared, and/or with three or four depths, with a grid or honeycombed, etc., a shape which would either be very difficult or impossible to machine, is a bargain.

Indeed, the \$0.0256 does not truly represent the cost of a particular type of cored hole, it represents the cost of a coring operation. Such a coring operation might put a very intricate and complicated variety of hole in the casting whose cost if it were to be machined-in would far exceed the \$0.0256. This, incidentally, is one of the major advantages of the die casting process.

The reader should remember this one aspect of the die caster's pricing problem: Pricing your die castings calls for a great deal of consideration on the part of your die caster—he has no *factor* system. Appreciate the effort he exercises in preparing your quotation.

Table No. 4
TOTAL COST OF PARTS A, B, C, D, E, AND F
IN QUANTITY PRODUCTION LOTS

Part Letter	Quantity	Initial Die Cost	Total Die Cost	Piece Price	Total Cost
A	1,000	\$1,200	\$1,200	\$0.0794	\$ 1,279
"	10,000	"	"	"	1,984
"	100,000	"	"	"	9,140
"	1,000,000	"	6,000	"	85,400
B	1,000	1,800	1,800	0.0902	1,890
"	10,000	"	"	"	2,702
"	100,000	"	"	"	10,820
"	1,000,000	"	9,000	"	99,200
C	1,000	1,300	1,300	0.1162	1,416
"	10,000	"	"	"	2,462
"	100,000	"	"	"	12,920
"	1,000,000	"	13,000	"	129,200
D	1,000	2,100	2,100	0.1013	2,201
"	10,000	"	"	"	3,113
"	100,000	"	"	"	12,230
"	1,000,000	"	10,500	"	111,800
E	1,000	1,500	1,500	0.1252	1,625
"	10,000	"	"	"	2,752
"	100,000	"	"	"	14,020
"	1,000,000	"	15,000	"	140,200
F	1,000	1,100	1,100	0.1443	1,244
"	10,000	"	"	"	2,543
"	100,000	"	2,200	"	16,630
"	1,000,000	"	22,000	"	166,300

Table No. 5
TOTAL COST DIFFERENCES BETWEEN PARTS WHERE
TOTAL REQUIREMENTS ARE ONE MILLION PARTS

Part		Difference	Number of Cored Holes	Cost Per Cored Hole
F	F-A	166,300 85,440 80,900	4,000,000	\$0.0202
E	E-A	140,200 85,400 54,800	4,000,000	\$0.0137
D	D-A	111,800 85,400 26,400	2,000,000	\$0.0132
C	C-A	117,500 85,400 32,100	4,000,000	\$0.0080
B	B-A	99,200 85,400 13,800	2,000,000	\$0.0069

Cutting Tool Steel with Wire Nails

New powder compound hardens ordinary carbon steel tools to the point where they can be used for cutting or drilling blue spring steel, transforms wire nails into punches that can be driven through cold steel plate

By George E. Henry

AN alloying and fusing compound in powder form, for hardening steel, and a simple technique that provides an unusually easy method for deep-penetration hardening of cutting tools, dies, taps, reamers, as well as low-carbon cold rolled and machine steels, has been developed by the Necamp Metallurgical Laboratories of New York City. The process is of consuming interest not only because of results obtained, but also because of its utter simplicity. The compound is practically odorless and non-poisonous, and any machine shop novice who isn't chary of the sizzle of hot steel being quenched can successfully harden tools of any sort.

Common wire or finish nails, hand forged or ground into chisel-like tools, tempered and treated with this compound which bears the trade name "High-Speed-It", develop sufficient hardness to cut nails in two with a single hammer blow, without marring or dulling the edge of the "chisel". A finishing nail duly hardened by the process, can be quickly hammered through a $\frac{1}{8}$ " piece of bar steel, cold. Carbon drills similarly treated readily drill through an automobile spring leaf or blue spring steel with no apparent dulling of the drill.

That sounds as if it belonged in the "Believe It or Not" column. Well, seeing is believing, and the writer recently had the opportunity of seeing a demonstration of these almost



Here a hardened "chisel" made by hammering an edge on a common wire nail, is used to cut a nail in two. The cutting edge was undamaged.

This exhibit shows finishing and wire nails hardened by the process which have been driven through pieces of cold steel, with points intact.

incredible results in the modest laboratories in lower Manhattan, of welding the hammer and driving nails through steel. Believe it or not, that's exactly what was accomplished.

The inventor or creator of this unique compound is Samuel Necamp, chemist and metallurgist, who, as he says, years ago "had an idea" that a simple, dependable, economical, and non-poisonous process for hardening steels could be developed. Over the years he experimented with literally thousands of diversified compounds of metals, chemical and catalysts, patiently proportioning ingredients, experimenting, testing, discarding batch after batch, changing ingredients, changing proportions, until finally he hit upon a compound that met requirements and achieved results far beyond his expectations.

And the process is simplicity itself.

It merely involves heating carbon steel tools, for instance, by torch or in a forge or furnace, to a cherry red color, i.e., between 1400 and 1700 degrees Fahrenheit; dipping or rolling them in the compound and allowing it to fuse for 15 to 30 seconds. Then the piece is again heated until the compound is well fused into the metal, removed and quickly quenched in cold water or brine. There is no scale to be ground off; merely an ash that is easily removed by brushing, and the hardened tool is ready for use. To obtain greater depth of hardness, the heating and application of the compound is repeated before the quench.

The foregoing applies to carbon steel. In the case of high speed drills and tools, the piece is brought to a white heat, between 1800 and 2200 degrees, and an oil quench is used



A duly hardened chisel made of reinforcing steel is used to gouge a bar of tool steel, without apparent damage to the cutting edge.



A punch, made from a piece of soft reinforcing steel, after hardening, is readily driven through a piece of steel plate $\frac{1}{4}$ " thick.

instead of a water quench.

One of the unusually interesting demonstrations of how tough a piece of soft steel can be made by the process involved the hardening of concrete reinforcing rod, $\frac{1}{2}$ " in diameter, a material that is about as soft as any steel one can obtain. The 12-inch rod was first tempered and then hand forged into a chisel on one end and a punch on the other. After being dressed and sharpened on an abrasive wheel, the two ends were respectively hardened and the rod cut in two, making two tools—an unusually sharp punch and a chisel.

With the aid of a little muscle and a heavy hammer, the chisel readily cut into the side of a piece of Keto tool steel, without apparent damage to the cutting edge, and the punch was quickly driven through a $\frac{1}{4}$ " piece of cold steel plate three times

without apparent damage to its sharp point. In like manner, a piece of 18-8 stainless steel was quickly cut with the chisel, and the sides of a piece of tool steel were easily stripped and gouged. The cutting edge stood up perfectly in this severe test, though the soft end of the tool mushroomed under the hammering.

The accompanying illustrations show finishing and wire nails, duly hardened by the process, after being driven through cold steel; a nail being cut in two with a wire nail "chisel"; the punch being driven through a piece of quarter-inch steel plate; also, the chisel gouging the side of a piece of Keto tool steel.

Tough materials such as chrome-nickel steel, laminated plastics, filled plastics, and the like, are easily drilled, tapped, reamed or cut with small tools thus hardened, and the

inventor of the compound states that it may be satisfactorily used for hardening temporary or special tools, or dies made of easily workable metals. Also, he states that the compound can be used to advantage in surface-hardening powdered metal parts, imparting to the molded parts a hardness and durability equal to that of any case-hardened material.

The price of the compound is fourteen dollars a pound—sufficient for hardening approximately 1,000 tools—or less than a cent and a half per application. As evidence of its economy, a case was cited of a reaming job in which a worker had to change reamers after every fourth or fifth hole. The same reamers, after being hardened by this process, are said to have reamed more than 400 holes in the same stock before resharpening was necessary.



Simplicity features the process. A part is heated to a cherry-red, dipped in the compound, and after fusing, given a cold water quench.





Applying J-M
Super-Ex blocks
for high tempera-
ture insulation.

What the Purchaser Should Know About Heat Insulation

Practically every industrial plant has use for insulating materials of one type or another for high or low temperature conservation, and expenditures therefor should be regarded as investments that pay dividends in the form of lower power or fuel costs

● By Donald Frederick

INDUSTRIAL plants of all kinds today regard insulation not as an expenditure that may or may not be justified but as a plant investment that pays its share of returns in the way of lower power or fuel costs. In maintenance or new work where the conservation or insulation of heat is concerned it is not a question of whether or not insulation should be used—but what kind and what specific materials should be used for specific jobs.

Heat insulation materials run the whole gamut from cork or similar materials that may be used to keep heat *out* of some system to special

insulating bricks that may be necessary to keep heat *in* a system.

The oldest insulation that has been in common use in industry is known as "85% Magnesia" which is used in power plant work or where it is desirable to keep heat from being lost from boiler surfaces piping, etc. More of this insulating material is used in industry than all the others combined. This insulation is made up essentially of basic magnesium carbonate up to 85% total; the remaining 15% is composed of asbestos fiber.

It is furnished to industry in standard shapes and sizes, in curved sec-

tions, and in sheets of varying thicknesses. For piping work 85% Magnesia is furnished in half round lengths of different diameters—a common length is 3 feet. Thicknesses vary, depending on the temperature involved, the common thicknesses being 1" to 4" with the upper temperature for which it may be used being 600F. Magnesia insulation of the 85 per cent variety is often used in combination with materials that will withstand higher temperatures. The higher temperature material is laid up next to the high temperature surface and the outer coating is made up of 85% magnesia. This is an important

fact for the purchaser to understand because knowing this the buyer can arrive at "an economic thickness" of proper materials for a given job.

Easily Adapted to Job

85 per cent magnesia will stand reasonable handling and is cut easily with an ordinary hand saw. It lends itself readily to binding with wires and because of its compressibility it may be butted snugly to form a continuous sheet or cylinder. This insulation is known in the trade as one of the "moulded" types. The other principal moulded types of insulation are expanded mica (Vermiculite); diatomaceous silica and asbestos fiber, and asbestos fiber bonded with sodium silicate (water glass).

Expanded Mica

Expanded mica when mixed with some asbestos fiber and alumina is used for temperatures up to 1800F. It is more difficult to handle than 85% magnesia and the purchaser ought to schedule shipments of this material in such a way that a minimum of handling is given to it. This insulating material is one of the newer ones and consequently it is subject to improvement. It should be used where losses in application and handling can be minimized. It is quite compressible but very low in strength requiring special supports for application since it will not support itself.

Low Cost Insulation

Diatomaceous silica and asbestos fiber is very often used in conjunction with 85% magnesia to give a good insulating job at the lowest cost. This material is sold under various trade names. This insulation will take up to 1900F. with a minimum loss of heat.

Must Be Well Supported

Asbestos fiber bonded with sodium silicate is moulded to various shapes and sizes and is supplied in pipe and block form. In general this is a medium range material and will handle temperatures up to about 1000F and may be used quite successfully on such heat exchange equipment as boiler air preheaters where the maximum temperature would not exceed the figure given. Asbestos fiber must be well supported and fitted. Its usefulness diminishes rapidly where vibration is encountered or where the service is likely to be such as to cause breaks periodically. This asbestos fiber material bonded with sodium silicate

varies widely with respect to density and it usually is furnished in light-weight and heavier sections. While the heavier thickness will withstand some vibration more durable materials are recommended if the service is severe.

Mineral Types

Mineral types of insulation are becoming quite popular and there have been some rapid developments. Advantages of this type of insulation are that they are made from glass waste and minerals which are quite plentiful and consequently are generally cheaper. The product is produced by melting the basic material and then rapidly cooling it to form mineral fibers which are annealed together to form blankets which are held together by outer sheets of The annealed fibers are matted to thicknesses are available and replacement jackets are provided for use where removal and replacement may

be necessary. Some of the mineral types are known as "wools". This name comes from the character of the material which, like wool, has unusual compressibility. These insulations often break up when handled and will settle out to a certain extent. They are best used as fills. Maximum temperature for which they may be used is 900F.

Asbestos Felts

Where severe service is encountered for piping and similar structures the laminated asbestos felts will provide good life and excellent insulation where the maximum temperature does not exceed 700F. Because this insulation will withstand external abuse, wetting, and vibration it is used extensively for outdoor piping, underground, or where the insulation is not well protected.

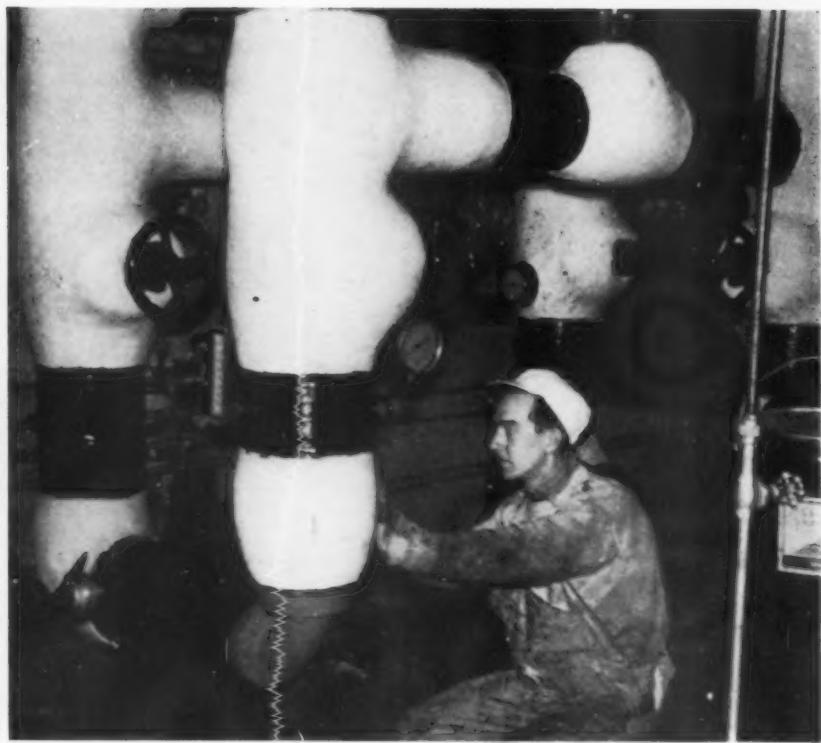
These felts are made by imbedding spongy particles in the felts and then cementing the layers together to ob-

Cutting J-M Asbestos Cell insulation to fit job.





A J-M 85% magnesia insulating job.



Applying rock-cork insulation on cold line in milk plant.

tain the desired thicknesses.

In all kinds of insulating work there is always need for cements and plastic insulating materials to provide smooth surfaces and tight joints. Rock wool, mineral wool and mica cements are generally used. Most of these may be made up with asbestos fibers and binder to provide the necessary workability and insulating qualities. Cements of this kind are shipped and stored in dry form and need only the addition of water to make them ready for use.

The success of plastic insulation varies with the expertness with which it is applied. The material is troweled to surfaces and is ideal for making repairs to broken sections and where cracks have developed. Cements are also used where the surfaces to be insulated are irregular and consequently do not lend themselves to the application of the regular shapes. The plastic insulations are not good for temperatures above 1800F.

Insulating Bricks

For the higher temperatures up to 2500 to 3000F special insulating bricks are required. These bricks are made from natural diatomaceous silica moulded from the same material that has been calcined, or made from a combination of refractory clay and diatomaceous silica. In general the brick type of insulation is used where

replacement is regular, where temperatures are high, and where the insulating structure must be built up from the refractory materials. Linings of various types of furnaces are made up in this manner. In choosing brick types of insulation it should be borne in mind that while the brick-work will support itself it will not support external structures.

Keeping Heat Out

While the discussion so far has been concerned with materials for high temperatures and for applications where it is desirable to keep heat *in*, it is just as important to select the right materials when the object is to keep heat *out*; keeping heat out actually means the retention of cold. However, in all work pertaining to insulation it is known that the flow of heat is from the higher to the lower temperature.

Broadly speaking, any material that can be used for high temperature insulation can be used for low temperature insulation. By "low" temperature is meant temperatures below those prevailing where people normally work, as in refrigeration systems.

The original and almost universal type of commercial low temperature insulation is cork; sawdust was used in many instances but not where high efficiency was desired. Sheet

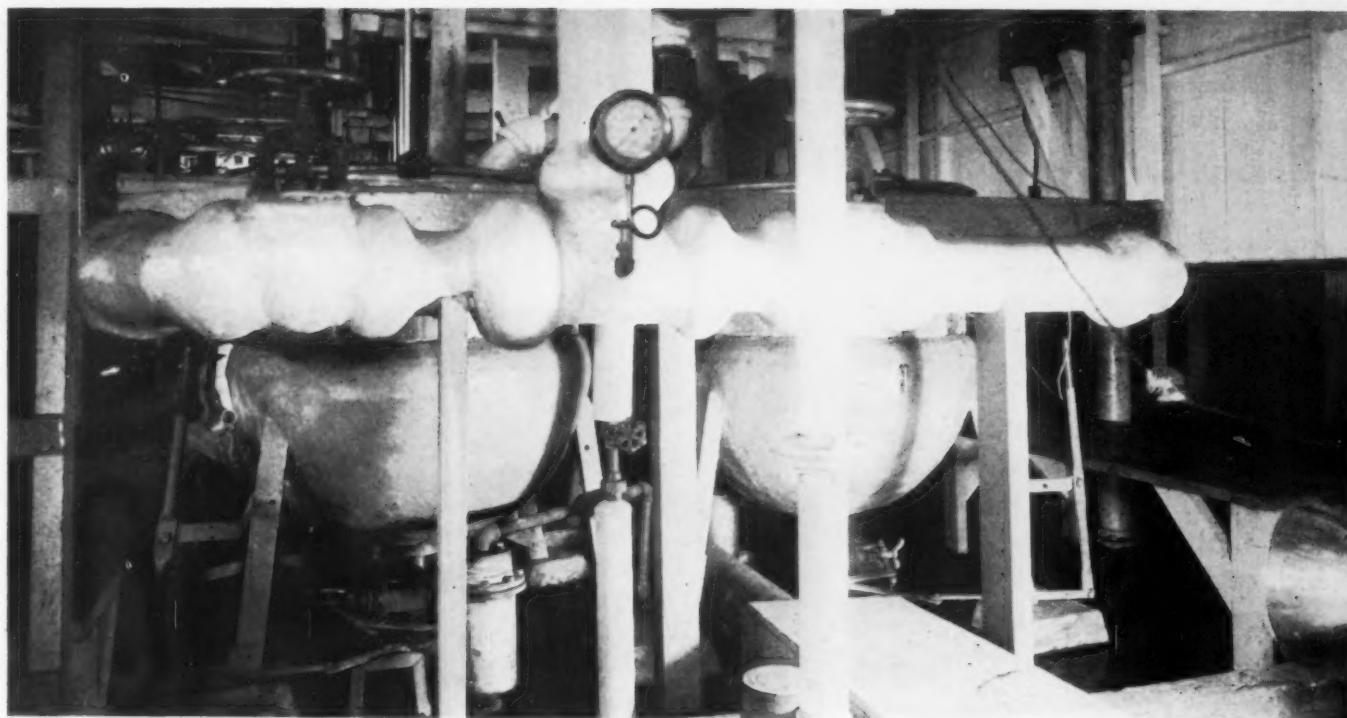
cork is still used but it is expensive and there are many of the newer types that will do the job just as well. Cork is used, but in granular form, and bonded into sheets of standard areas and thicknesses. Just as in high temperature work minerals and other cheap materials have been developed for low temperature work.

Insulation for low temperature work must be able to withstand high moisture, be rugged, and carry a load external to itself in many instances.

In addition to cork materials and variations of woods and waste vegetable materials the most modern insulation for low temperatures is made from minerals spun into fibers from the molten condition. The best known of these insulations is Fiberglas made by the Owens-Corning Fiberglas Corporation. Fiberglas has all the chemical properties of glass. For use the material is felted and compressed into bats. It is quite flexible, will not burn, will not decay and will resist acids.

Fiberglas Insulation

Fiberglas is now widely used for insulating household refrigerators, refrigerated truck bodies, refrigerated containers, and walk-in coolers. The material is shipped in various thicknesses and can be cut easily to any desired size depending on the application.



Finished job of low-temperature insulation.

In low temperature work it is common practice to use asphalt cements for coating between layers such as cork. This asphalt serves several purposes chief among which are vapor sealing against moisture transfer and actual insulation at joints and where good fit cannot be obtained.

Finishing Materials

The purchase of insulation involves also the purchase of finishing materials such as canvas jacketing materials and outside coatings which permit painting and other treatment of the finished job. This outside finishing is much more common with low temperature insulation than with high temperature work simply because high temperature insulation is quite frequently used in locations where outward appearance does not mean much. But a good-looking job is desirable where the general public is concerned.

Thickness Determination

One of the most important points in the purchase of insulation is that of thickness. For every job there is an exact thickness. This thickness is not always determined by the temperature nor is it always determined by the loss of heat or power that may be the result of insulation thickness. The correct thickness is

always determined by the cost per year of the insulating materials against the power or fuel loss. Thickness cannot be determined from a chart but each application must be analyzed. If for example an additional inch of material will pay for itself and reduce the fuel or power loss to the point where there is a net gain in favor of the extra inch then this additional thickness should be used. If the additional thickness provides a net loss in dollars over the gain in fuel savings (as computed from the first cost of materials, amortization, etc.) then the additional inch is not justified.

Proper Application

The best selection of materials will be nullified if the insulating materials are not applied properly. A good insulating job looks good also. Improper supports, bad joints, wetting from leaks, drying out because of improper protection of layers will all tend to shorten the insulation life and make early renewal necessary. Application costs for insulation work are high; the materials themselves are not inexpensive so it is necessary that a good job be done in the first instance.

All insulating materials do not handle alike with respect to application. Moulded blocks require less support than other types. Blankets

may require very rigid supports. Cements have to be applied in layers of the right thickness to give the best service and quite frequently it is good business to provide the plastic insulations with wire mesh reinforcement.

Handling and Storage

A word ought to be said about the general handling of all insulation materials and the storage problem. Most of the insulations store best if they are kept in their shipping containers and never taken out until they are taken out to be applied. The storage space should be clean, cool and not too dry. Dehydration is bad for most insulations. If the cartons are stacked right they should not carry external weight; there should be provision for air circulation around the containers or sheets.

Do not Over-buy

Purchasing practices should be aimed at having the shortest time elapse between shipping from the factory and actual use. If too much time interval is involved handling and drying out may run away with considerable money. Excessive amounts of insulation should not be kept on hand for repair work. The purchasing department will do well to keep the actual users informed so that actual needs can be anticipated and buying done accordingly.

Misconceptions of Public Purchasing

• By Maurice G. Postley

Critics of governmental purchasing methods sometimes overlook the fact that the system of bid and award is the epitome of business competition, and that it precludes neither purchasing judgment nor competitive selling

ONE of the largest manufacturers in his field once told me that he would not sell a public agency, "even if the buyer walked in and begged me."

"There is no amount of business the government could give me that I would take", he said.

The reason?

"I refuse to get mixed up in government red tape," he replied.

He hasn't sold a dollar's worth of goods to a governmental agency up to the present time and he is still adamant.

He is not the only one. There are others. And the surprising part of it is that he daily puts up with as much "red tape" from his regular customers as he would have to face in public agencies.

I have witnessed the day when a large chain store group turned his organization upside down by changing the quantities of items to be delivered and changing all the delivery points, from Coast to Coast. Had a public purchasing agent done it, I'm sure he would have added the experience to his prejudice against "government red tape".

Like many others, my friend is collecting an increasing amount of misinformation and deserting the one field in all the world where free enterprise, which he champions, gets a



really practical test every day in the week.

This and many other misconceptions of public purchasing have existed for a long time. Since the volume of public buying is so great and so many of the biggest producers in the country eagerly compete for public business, the holdouts might normally not cause much concern.

But something important is happening in public purchasing and the time has come when all interested in the public welfare, as well as healthy business competition, should join to clarify the foggy, prevalent notions about public buying.

There is a real danger that misconceptions concerning public buying may become more acute because public purchasing agents are growing more aggressive in their search for sources. In addition, the national movement toward more efficient buying techniques in public agencies will

be felt by all sellers. As the search for wider and wider competition grows, more and more producers and sellers will have direct contacts with governmental agencies. Now is the time to understand "the government's" buying methods, for "the government" is a good customer, notwithstanding its critics, and government business should be profitable business.

One need look no farther than the National Academy for Public Purchasing, which has been sponsored by the Federal Bureau of Supply, to see that public purchasing agencies, at all levels of government, are reaching out for goods from every corner of the country. It is not an accident that the National Institute of Governmental Purchasing proposed establishment of the Academy, the purpose of which is to spread information concerning new and efficient buying techniques. Public purchasing

agents are aware of the failures of the past and are earnestly bent upon broadening the supply base for governments.

We have a number of leading misconceptions to deal with—and a myriad of minor ones.

The "red tape" dragon is the monster that must first be slain, for once it is disposed of, many smaller, fearsome devils will disappear with it.

What is the basis for the allegation of "red tape"? The answer, curiously, lies in a direction that the critics never seem to think of. The answer is, in fact, one of the major differences between public and private buying of any kind. The public buyer has to operate within laws, rules and regulations properly adopted to prevent waste and corruption to the greatest extent possible because he is spending the taxpayer's money. Who would give any public purchasing agent a blank check? Why should any public purchasing agent have one?

The public purchasing agent is, and should be, held accountable publicly for everything he does. He spends my money—and yours—and we want to know what he does with it.

Now then, the private purchasing agent has to be no less circumspect, no less skilled, no less careful. But he is not answerable to the public. Why should he be? He is answerable to his employer, and that is the way it should be. It is none of the public's business how he buys—unless he actually violates a law.

Regulations Are Necessary

For the public buyer, we all want laws and rules of some kind. For the private buyer, the rules, such as they are, may be devised within the business organization he serves—and altered any time anyone wants to change them.

It is clear, therefore, that a public purchasing agent simply must, in the public interest, operate within a framework set up by law to protect us all. It is unfortunately true that, from community to community throughout the country, the rules differ and offer much confusion to the seller, but it is certainly better to have some rules, whatever their imperfections, than none at all.

There you have the origin of "red tape." The rules create the procedures that are so often mistaken for "red tape". Government generally may suffer from too much "red tape" and as a result, public purchasing agencies are tarred with the "red

tape" stripe for the sins of other public agencies.

Public Responsibility Is Different

While the big job ahead for governmental buyers is to streamline their operations so that a business man can profitably do business with them, there is also a big job ahead for sellers. That is to understand the problem, cast aside prejudices and encourage those who want to see government buying every bit as efficient and practical as private buying.

It would be idle to argue that we do not have red tape in governmental buying. Of course we do, if by "red tape" we mean unnecessary procedures. In many cases, as the David Joseph survey for the National Institute of Governmental Purchasing revealed, this is due to archaic laws, rules or regulations with which the purchasing agent is saddled by his law-making body. One phase of the educational campaign that lies ahead is to demonstrate the folly of these ancient laws and to seek their renovation or repeal.

On the other hand, the clear distinction between what we must have in public buying and what we need not have in private buying should be recognized. There is much reason to believe that many of the old distinctions will disappear as the bright light of modern methods is sprayed on public purchasing practices. Perhaps the National Academy for Public Purchasing will make a contribution to this.

The prospects for understanding are good. Last year witnessed the meeting of minds on both sides of the fence. Representatives of industry who sell to government sat at the same table as public purchasing agents at the NIGP conference and met the issues candidly. Clifton E. Mack, Director of the Bureau of Federal Supply, presided at the panel discussion on "How to Make it Easier to do Business with Government." That was a step forward, perhaps not then recognized generally for its real significance.

One of the most valuable contributions that industry can make to

public purchasing problems today is to help get the facts on procedure—or "red tape", if you please. How vital this is was delineated sharply in the NIGP survey last year. The survey questions included several which, it was thought, would disclose fairly unanimous practice. But when the returns from 235 governmental agencies at all levels came in, it was found that the presumably obvious practices are adopted in one half of the communities and not in the other half. In fact, some adopt exactly the opposite methods. This, indeed, is confusing to business. It is one of the fertile fields for improvement, but it should not be misinterpreted as proof of "red tape".

Continuity of Business

Linked to this whole problem is another misconception that needs airing: namely, the criticisms made of award to the lowest responsible bidder on the grounds that it breaks continuity of supply. Let's approach it the other way: would anyone argue that there should not be formal, competitive bidding in public purchases? What about the resultant abuses? Many of those who now say, "We only get the business because we are the low bidders," would be the first—and properly—to complain if competitors got the business when they were not low bidders. Further, the whole conception of "lowest responsible bidder" in public purchasing gives the purchasing agent adequate elbow-room to make awards in the best public interest. But he cannot and he should not be able to ignore the competitive aspects of public purchasing. Indeed the public agency market is the one market where our traditional notion of true competition and free enterprise gets full play.

Finally, in the public interest, which is more important—that one supplier enjoy continuity of business, or that the whole business community know that every producer bids on equal footing? It is directly in the best interest, not alone of the local taxpayer, but of business men,

(Please turn to page 330)

THE AUTHOR acquired his practical experience in purchasing as Superintendent of Supplies for the Board of Education, New York City. He was one of the organizers of the National Institute of Governmental Purchasing, Inc., and is a past president of that organization.

Synthetic Detergents— An Explanation

These days Purchasing Agents hear more and more of the wonders of the "new" synthetic detergents. This article explains the origin and nature of synthetic detergents, their relationship to the more familiar soaps and alkalis, and their place in industrial cleaning operations.

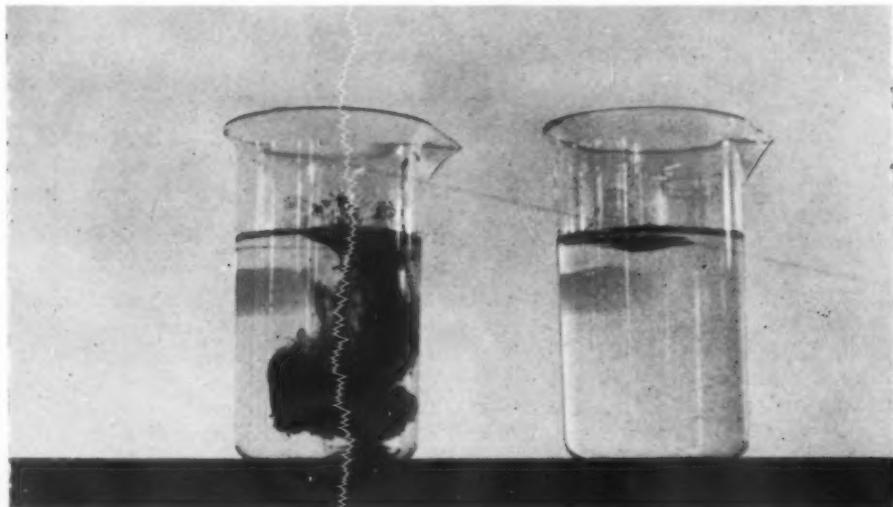
By Donald Price

Technical Director, Oakite Products, Inc.

If one attempts to wash one's hands with plain water, the process is not very successful. A great deal of rubbing and rinsing is needed to make any impression on the dirt and even after much time and effort the hands are probably still not really clean. Now if a small quantity of soap is added to the water, the results are quite different. As the hands are rubbed together considerable foam is formed, the dirt particles seems to be lifted off the surface of the skin, and any grease or oil present is readily removed. The solution becomes cloudy as the dirt is taken up and suspended in the water. This behavior of soap is characteristic of the materials we call detergents, of which soap is the oldest and still by far the most widely used.

In spite of its effectiveness and wide acceptance throughout the world as a cleansing agent, soap suffers from some serious disadvantages. In so-called hard water which contains dissolved salts of calcium and magnesium, its cleaning power is greatly reduced. Persons living in hard water areas are only too familiar with the absence of foam and of the sticky curd-like substances which form when ordinary soap is used.

These curds are produced by chemical action between the dissolved salts and the soap itself, and actually prevent cleansing until a large quantity of the soap is first used up. Moreover, they deposit on the skin, on fabrics or on other articles being washed, from which they are quite difficult to rinse off. The same holds true to an even greater extent if one attempts to use soap in salt water.



What a minute amount of wetting agent will do: Beaker at right contains plain water. The one at the left contains water to which has been added .06 of an ounce of wetting agent. An equal quantity of lampblack was added to the beakers. Within four seconds, action of wetting agent in beaker at the left caused the lampblack to precipitate. It floated on surface of right beaker for two hours before sinking.

(Photo courtesy of Oakite Products, Inc.)

In certain industrial processes, it is sometimes necessary to wash fabrics in acidic solutions, as in dyeing textile fabrics with certain classes of dyes. In these cases, soap cannot be used at all as it precipitates out in sticky curds similar to those obtained in hard water and exerts no cleansing action whatever. A further practical disadvantage of soaps lies in the fact that they are made directly from animal and vegetable fats and consequently in times of scarcity tend to come into competition with human food.

As a consequence of the foregoing disadvantages inherent in soaps, chemists some years ago turned their

attention toward developing detergents derived from sources other than fats. Their efforts proved highly successful and have resulted in the so-called newer synthetic detergents. These substances are produced or "synthesized" in chemical plants, starting with such raw materials as petroleum, coal tar chemical or by-products such as those of the paper industry, making use of chemical reactions which are often quite complicated.

Synthetics Are More Efficient

The synthetics not only lack the drawbacks possessed by soaps but, in many cases, are considerably more

efficient cleansing agents than the latter. One often hears them referred to as wetting agents or penetrants because of the capacity of their water solutions to wet surfaces or penetrate complex materials such as textile fabrics almost instantaneously. This rapid wetting and penetration permits the detergent solution to detach the dirt from soiled articles with considerably greater speed and completeness than is the case with the older soaps.

A spectacular demonstration of the effectiveness of wetting agents was given by the technicians of one of the largest manufacturers of these products a few years ago. It consisted of adding a small amount of one of their best wetting agents to a tank of water upon the surface of which a duck was swimming. Almost instantly the duck, much to his dismay, sank in the water up to his neck. This sensational result was, of course, due to the fact that the duck's feathers which are ordinarily kept dry by the presence of a film of oil, were thoroughly wetted by the water, thus greatly increasing the bird's weight.

The synthetic detergents, as they have now come to be called, were first discovered in Germany during World War I through the efforts of German chemists to produce cleansing materials independent of fats which were then so vitally needed for food. They were commercially developed some time after the war particularly for use in textile processing where the shortcomings of soap are a distinct disadvantage.

Industrial Cleaners

About fifteen years ago these products were introduced into the United States and they have since undergone a tremendous growth and development and have spread into a variety of other industries. As early as 1941, Dr. Lenher of the DuPont Company was able to cite several hundred well established industrial uses for synthetic detergents other than in the textile industry. It is clear from what has been said that detergents or wetting agents are not altogether new but in fact have been in use for many years in a number of industrial processes notably in the field of textiles. The reason that so much is heard about them at present is that materials containing these agents are reaching the consumer more and more and that the benefits of their use are being more and more brought home to the general public.

The alkalis such as caustic soda, the

soluble silicates and various phosphates constitute the third class of cleaning materials, which are of vital importance to industry. Industrial cleaning, where soaps are rarely applicable, is done with suitably balanced mixtures of these substances. The properties of the synthetic detergents, ability to promote rapid wetting and penetration, to suspend dirt particles in water and to emulsify oils, make them highly desirable ingredients in modern industrial cleaners, a fact which was early recognized by progressive cleaning material manufacturers. One may safely say that it would be well-nigh impossible to meet present-day demands for high speed production without scientifically compounded industrial cleaners which provide the required cleaning results through a combination of carefully blended ingredients.

Many examples of the advantages accruing from the use of properly selected detergents or wetting agents as ingredients in industrial cleaners, may be cited. They are used in electrocleaners where they promote rapid wetting and free rinsing and where the risk of "plating out" soaps on the work is obviated. In spray washers used in production cleaning, their rapid wetting out of the dirt, speedy emulsification of the greases and oils permit a larger number of parts to go through the machine at greater speeds. Moreover, the conditions of

low foaming and stability in hard water, are also readily met.

The synthetics have brought about a new era in the dairy and food field where their property of free rinsing avoids the danger of soap films which harbor bacteria. In cases where much hand washing has to be done, their use eliminates the necessity for high pH materials which attack the workers' hands. There is also less attack on bottles because of the free rinsability of the solutions. The use of acidic cleaning materials was made possible by the advent of the synthetic detergents. Through their power to lower surface tension, rapid wetting of scale and penetration of rust is secured, thus promoting its easy removal. The adherence of "smuts" is also prevented.

Expanded Use Foreseen

The characteristics of these new detergents are constantly under study in the research laboratories, especially in connection with their behavior in industrial cleaning processes. This has resulted in improved materials and greater cleaning speeds, thus permitting stepped-up production. The development and use of synthetic detergents has barely begun and the future is likely to see a greatly expanded use of these materials in many fields, with results that may, in some cases, be nothing short of revolutionary.

Industry today demands fast-acting, effective detergents that will keep pace with speeded up production schedules. Gas meters shown here travel through oval-shaped automatic washing machine to emerge at right clean and bright, ready for inspection and repair.

(Photo courtesy of Brooklyn Union Gas Co.)



Avoid Contract Law Suits and Pitfalls

Court decisions clarify basic law on the validity of contracts and payments, title to purchased merchandise, and liability for damages resulting from non-performance

• By Leo T. Parker

RECENTLY a reader wrote in des-
pair over losing a \$32,000 law
suit. He said that ever since taking
his first position as purchasing agent
for a large corporation he realized
the importance of preliminary legal
training to avoid heavy financial
losses resulting from law suits on sale
contracts, but that he spent too much
time making money for his employer
instead of learning something about
how to keep it for him. This is what
he said: He asked that I review late
and leading higher court decisions on
the current law of when an employer
is liable and not liable for contracts
made by purchasing agents, and when
payment for merchandise made by a
purchaser to a seller, or his agent, is
valid payment. Also, he wants to
know when a purchaser really owns
merchandise he purchases.

Briefly the answer to the first
question is: If a purchasing agent is
authorized to sign a contract, or if
the agent's employer ratifies the
contract, after it is signed, the employer
is liable on the contract. Otherwise
the employer is *not* liable.

Let us state these further simple
facts of law: Payment made for mer-
chandise *not* correctly described in a
contract of sales may be a total loss.
No purchaser can make a valid con-
tract to purchase stolen merchandise.
A sale contract is void which violates
any state or United States law.

For example, see *Manning v. Mil-
ler*, 206 S. W. (2d) 165, reported

March, 1948. This suit involved the
sale of an automobile by a seller
named Miller. The description of the
automobile given in the sale contract
and chattel mortgage was *incorrect*,
in that the motor number was given
as 6-26378, while the correct motor
number was 6-2637H. Miller bor-
rowed \$1,056 from Weir Sales Com-
pany which knew nothing of the past
transaction. Miller signed a note
and gave a chattel mortgage on the
automobile to secure the note, with
the *correct* motor number. However,
the Weir Company failed to comply
with the state's Certificate of Title
Act, and in later suit his lien was held
by the higher court to be void. Hence
Weir lost \$1,056.

Then Miller two weeks later sold
the same automobile at Manning's
place of business and Manning paid
him. On the same day Miller simply
got into the automobile and drove it
away. Actually he "stole" the auto-
mobile from Manning's place and
drove it into another town where 10
days later he sold it to New Yorker
Auto Sales Company for \$1,250. All
told by these transactions Miller
owed \$1,042 to the first company;
\$1,056 to Weir Sales Company;
\$1,200 to Manning Auto Company;
and \$1,250 to New Yorker Auto
Sales Company. Total \$4,548. But
still he had the automobile in his pos-
session. Hence *four* purchasers must
be subsequently engaged in a suit.

A few days thereafter the San An-

tonio police seized the automobile
from Miller. Then the case "came to
a head".

In subsequent litigation the higher
court held the first company's mort-
gage void because the automobile's
motor number was incorrectly listed
in the mortgage. In this report the
higher court said:

"The note, mortgage and judgment
held by Plauche-Locke Securities,
Inc., each containing a wrong descrip-
tion of the automobile, and could not
affect the rights of third parties deal-
ing with Miller with reference to that
automobile."

The higher court also held Weir
Sales Company's lien void because
Weir had failed to comply with the
state law regarding registering the
certificate of title. And the higher
court held that the lien of the New
Yorker Auto Sales Company was
void because Miller "stole" the auto-
mobile after selling it to the Manning
Auto Company. Hence the latter, or
Manning Auto Company, was award-
ed possession of the car. The court
said:

"When John Miller sold the auto-
mobile to Manning and delivered to
him possession thereof and received
the full consideration therefor, as be-
tween the two, Manning became enti-
tled to the possession of such auto-
mobile, and when Miller thereafter
took it without the consent of Man-
ning the automobile became a stolen
automobile. The fact that Miller

stole his own automobile does not prevent this automobile from being a stolen one."

Briefly, it may be said that the New Yorker Auto Sales Company had no legal title to the car because it purchased a stolen automobile, and no purchaser acquires any title to purchased goods stolen by the seller. The Weir Sales Company's lien was void because this company failed to comply with a state law which required the sale contract to be filed or registered. The first seller lost his lien because the description of the automobile, or motor number, in the contract of sale was incorrect.



I cite and explain this unusual law suit to forcefully illustrate to purchasing agents the importance of knowing payments made for merchandise not correctly described in a contract of sale may be a total financial loss; second, a purchaser of stolen merchandise is certain to lose his financial investment; third, all contracts are void which do not conform with state and United States laws.

Know the Law

Conversely a purchaser may profit from a seller's ignorance of law. Certain states have enacted statutes prohibiting payment for certain merchandise. A seller who violates such a law cannot recover payment for merchandise delivered and accepted by a purchaser. The sale of warehouse receipts is, of course, equivalent to sale of the merchandise itself. An outstanding higher court decision verifying this statement of law is *Crosby v. Faroe Trading Corporation*, 27 So. (2d) 367.

A Mississippi state law provides that any seller giving credit to purchaser for intoxicating liquors shall lose the debt. Without knowledge of this state law a man named Martin sold to a person named Rose in Mississippi warehouse receipts covering one hundred barrels of whiskey in storage in the State of Kentucky.

Rose failed to pay the agreed price for the warehouse receipts and Martin filed suit.

Notwithstanding the fact that Rose had sold the warehouse receipts for near \$5,000, the higher court held that Martin could not collect any money from Rose. This court said:

"The sale of standard negotiable warehouse receipts covering whiskey is a sale of the whiskey... We can follow only the statute. Purely ethical considerations we are not competent to discuss nor decide."

In other words, this court realized that it was unethical for Rose to accept the warehouse receipts, sell them for \$5,000, and then refuse to pay Martin the agreed contract price. But the court was bound to render its decision in consideration of the state law.

Law of Payment

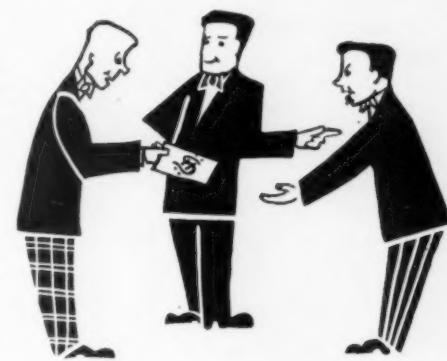
Obviously, valid payment for merchandise involves an important element of law. Unless the payment is valid such payment is a total loss. Hence, if payment is not made *legally* by a purchaser, it is certain that he may be compelled to pay twice for the same goods. This unfortunate situation has happened many times in the past, and will reoccur in the future unless purchasers know the law. We shall review a few late higher court decisions which impart new and valuable legal information on this subject.



According to a recent higher court, definite proof that a purchaser paid an agent *authorized to receive payment* is necessary in order that the purchaser shall receive credit for the payment. Hence, it is important to know that recently a higher court held that a purchaser of merchandise can pay either the seller or any person the seller authorizes him to pay. Payment to either such party is legal payment.

For illustration, in *Macbeth v. West Coast Packing Corporation*, 187

Pac. (2d) 815, reported February, 1948, the testimony showed facts, as follows: A seller sold certain fishing nets with accessories to the West Coast Packing Corporation for the sum of \$4,500. At the time the nets were delivered the purchaser paid the seller \$500 down. Later the seller in writing assigned a \$1,000 of the \$4,000 due from the purchaser to a creditor. The buyer then paid this \$1,000 to the creditor. Later the seller sued the purchaser to collect the full \$4,000.



The higher court held that the purchaser owed only the difference between the \$4,000 and the \$1,000 he had paid the seller's creditor. In other words, this court held that the purchaser was safe from future suits by the seller, having paid *on a written order* authorizing the purchaser to pay a part of the contract price to a named person.

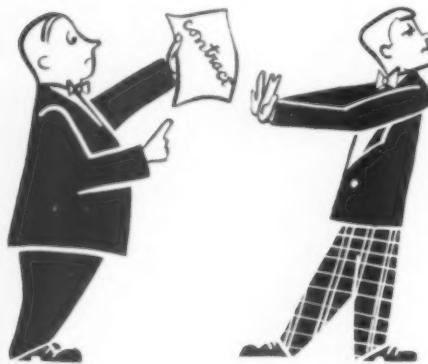
On the other hand, let us assume that a seller *verbally* authorizes a purchaser to pay all or a portion of money due on a sale to a named person. The purchaser will find it necessary to pay the bill *twice* unless he can convince the court, and prove by dependable witnesses, that the seller actually authorized payment to a third party.

Then again, assume that an official of a corporation, or an employee of a partnership or individual, authorizes a purchaser to pay money to a third party. Under no circumstance can the purchaser receive credit on his bill for this amount, unless he proves positively that the official or employee was legally empowered to make this special authorization. All of which means expensive litigation by the purchaser with ultimate chances of losing the suit. Also, if the testimony shows that the seller was insolvent, the latter's creditors may sue you and recover the amount paid. Motto: Never pay money on an account to any person or company except directly to the seller. If a seller requests you either in writing or verbally to pay money to a third

person, simply refuse to do so, but pay the seller, who can distribute the money as *he* sees fit without *your* incurring any liability.

Minds Must Meet

Now, let us review the law on validity of sale contracts. A review of late leading higher court decisions clearly and positively verify that a great majority of legal controversies relating to sale contracts arise from misunderstanding over verbal agreements. This is so because under no circumstances is a contract valid and enforceable unless the minds of both the buyer and seller "meet". In other words, the buyer and seller must have agreed on all details of the contract or no contract is made. This result may be accomplished when either a buyer or seller accepts in all details, and without any restrictions, an offer submitted by the other party. Unless such offer is unconditionally accepted, the minds of the parties do not meet and, therefore, a valid is not made.



For illustration, in *Great West Grain & Seed Company v. Ray*, 204 S. W. (2d) 26, reported August, 1946, the testimony showed facts, as follows: The Great West Grain and Seed Company sent a representative or purchasing agent to negotiate purchase of seed from a seller named Ray. After the company's agent and Ray agreed on all details of a purchase contract, these two parties signed a written memorandum dated May 30. The agent delivered the contract to his employer, the seed company.

The manager of the seed company did not acknowledge this memorandum "as is" but wrote Ray that the company's offer to buy the seed was being withdrawn. The evidence indicated that the company's agent then went to see Ray again who orally agreed to sell the seed company the seed described in the former contract. However, these latter

facts were not clearly proved regarding the oral agreement.

Ray did not deliver any seed to the seed company but sold some 500,000 pounds of seed to another company.

The Great West Grain and Seed Company sued Ray for damages based on breach of the May 30 contract. The higher court refused to hold Ray liable saying that no enforceable contract ever was made between the seed company and Ray. This court said:

"An agreement to be binding must be definite and certain. . . . As has been stated, the undisputed evidence was that this contract was to be confirmed by appellants (Great West Grain and Seed Company). The evidence is likewise undisputed that the letter of June 1st was not a confirmation of the purported contract of May 30. It was tantamount to a rejection, rather than a confirmation. There can be no doubt that there was no meeting of the minds of the parties on the terms of the purported contract of May 30. . . ."

Hence, this court refused to hold that a valid contract existed, first, because the purchaser failed to approve the May 30 deal made by its agent and, second, the purchaser relied on uncertain verbal testimony which Ray was *supposed* to make with the seller.

Hence, both the Great West Grain and Seed Company and Ray could have avoided litigation and most certainly the former could have won this suit if it had acknowledged and accepted the offer of May 30 made between its purchasing agent and Ray, the seller. However, the seed company rejected the offer and then, instead of making a written contract with Ray, it relied on the alleged verbal agreement between Ray and its agent to the effect that Ray would deliver to the seed company the seed described in the contract of May 30.

President's Authority

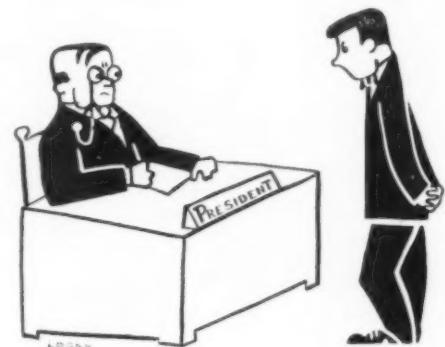
Recently a higher court laid down the law that when the president of a corporation makes a contract not pertaining to his official duty, or not within the scope of his employment, such contract is not binding on the corporation.

For illustration, in *Yeskel v. Murray Company*, 54 Atl. (2nd) 224, a purchaser sued a corporation, to compel it to complete a contract of sale. The testimony showed that a purchaser offered in writing to purchase a project from a corporation for the sum of \$125,000.00. The corporation's directors accepted the offer and sent its president with a

written contract to have it signed. This contract contained among other things a clause to the effect that a mortgage would be taken from the purchaser for \$85,400 to assist financing the purchase price, and that the latter "shall have the right to prepay any part or the balance of the purchase price after six (6) years from the date namely. . . ."

The president changed this specified "six (6) years" to "three (3) years", and then signed the contract.

In view of this change made by the president, the higher court held the contract void, saying:



"The president had no power to alter the provisions of a formal contract entered into by the corporation itself. The act of the president of a corporation, unless it is shown to pertain to his official duty, or to be within the scope of his employment, which was not shown in this case, cannot be regarded as the act of the corporation, and is not binding upon it."

Partnerships Are Different

Of course, this is not the law pertaining to partnerships. Readers should realize the legal distinctions, and thus avoid future expensive law suits. While an ordinary employee a corporation, cannot make valid contracts outside the scope of their authority, yet *any* partner may make a valid contract pertaining to the partnership business without authority, approval or acceptance by the other partners.

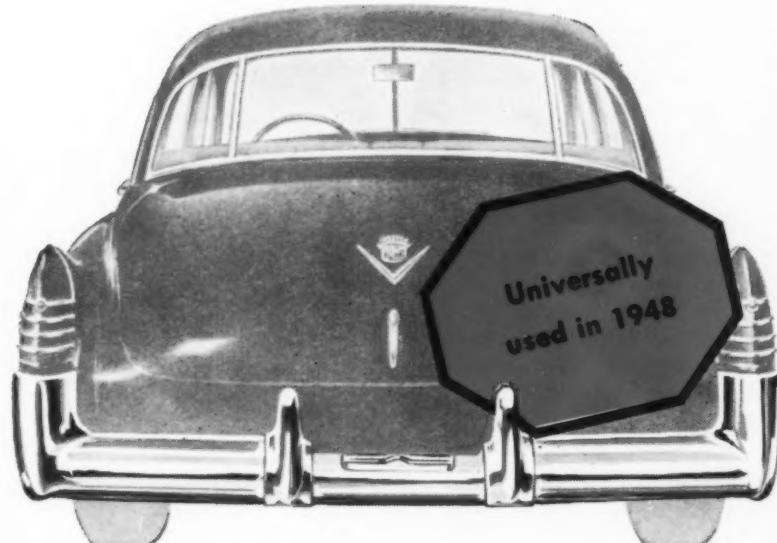
Under all circumstances, of course, the one partner financially responsible must pay the total amount of the partnership debts although it greatly exceeds the assets of the business. On the other hand, if a business is incorporated for, say \$5,000, the holder of a judgment for a larger sum is limited to a recovery of \$5,000, irrespective of the financial status of the incorporators of the business.

Hence partnerships have many glaring and distinctive defects and

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Low-Alloy Steel**



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N-A-X Alloy Division • Detroit 18, Michigan
UNIT OF NATIONAL STEEL CORPORATION

disadvantages. The most glaring one is that if only one partner is financially responsible he is obligated to pay all debts incurred in the operation of the business, although such debts are authorized solely by a partner who has little or no financial investment in the partnership. And, of course, a single partner may be held solely liable for debts of the partnership, although he is a silent partner. And all courts hold that any partner may embezzle or "steal" funds from a partnership and he cannot be prosecuted for embezzlement. This is so because a partner is an owner in the partnership. (See *Hoose*, 205 S. W. (2nd) 875).

Jury Believes Seller

It is true, of course, that many law suits relating to verbal contracts are decided in favor of a seller whose testimony the jury believes, although the purchaser contradicts the seller's testimony.

For example, in *Beasy v. Schneider*, 205 S. W. (2nd) 162, reported December, 1947, the jury believed the testimony given by a seller and ordered the purchaser to pay the seller the full amount of his bill. The higher court approved the verdict, saying:

"... Whether this was negligence resulting in damage was submitted to the jury."

For comparison, see *Jacksonville Paper Company v. Smith & Winchester Mfg. Company*, 32 So. (2nd) 326, reported January, 1948. The testimony showed facts, as follows: The Smith and Winchester Manufacturing Company sued the Jacksonville Paper Company on a paper bag machine which the manufacturer had represented would manufacture garment bags at a specified speed. The paper company refused further payments and proved that the manufacturer had agreed to build the machine on approval. In other words, if the machine would not satisfactorily make sixty garment bags per minute guaranteed by the manufacturer, the paper company had the privilege of returning the machine without further obligation.

The jury awarded a verdict and judgment for the manufacturer or seller for the value of the bag machine, \$3,552.62, plus interest thereon in the amount of \$1,825.52, or a total of \$5,378.14. The jury also awarded the paper company or purchaser \$860.00, plus interest thereon in the amount of \$327.07, or a total of \$1,187.08.

However, the jury refused to allow the paper company large damages

based on wages paid to its employees while attempting to make the machine operate efficiently. The jury refused to award damages for "loss of production and speculative profits", because the paper company, or purchaser, did not prove that it sustained this amount of damages.

Ambiguous Clauses

Hence, where a buyer and seller have no written contract, testimony must be given to prove the rights and liabilities of the parties. The one whose testimony convinces the jury will win the suit. Moral: Don't rely on verbal contracts. But remember this: Any ambiguity in a written contract will be decided *against* the one who wrote it.



For example, in *Baird v. Lindblad*, 170 Pac. (2nd) 488, it was shown that a contract was upon a printed form, with portions filled in by typewriting. The contract contained an ambiguous clause.

The higher court held that the contract having been prepared by the writer, any ambiguity therein was properly resolved against him.

Performance and Liability

Modern higher courts consistently hold that if a seller breaches his written contract to sell merchandise to a purchaser, the latter may sue and recover as damages the anticipated profits he would have earned had seller fulfilled the terms of his contract. If the purchaser discovers that the seller intends to breach the contract, the purchaser may file suit and compel the seller to fulfill his assumed and written obligations.

For illustration, in *Michigan Sugar Company v. Falkenhagen*, 220 N. W. 760, it was shown that a buyer and seller signed a written contract under which the seller agreed at a stated price to deliver certain merchandise to the purchaser.

About the time the goods were ready for delivery the purchaser discovered that the seller intended to

deliver the same to another company, a competitor. The purchaser immediately filed suit to prevent the seller from disposing of the merchandise, and compel him to fulfill the terms of the contract.

Law of Fair Damages

In holding the seller liable to the purchaser, this court said that the measure of damages allowable for failure of a seller to deliver merchandise contracted for is the difference between the contract price and value of the merchandise on the date the seller refused to perform the sales contracts.

Therefore, a purchaser may recover the full prospective profits he would have earned if he proves that the seller breached the contract. Briefly: the law of fair damages is, as follows: (1) Where the ownership in the merchandise has not passed to the buyer, and the seller wrongfully neglects or refuses to make delivery, the purchaser may recover "reasonable" damages for nondelivery. (2) The correct measure of damages is the loss directly and naturally resulting, in the ordinary course of events, from the seller's breach of contract. (3) Where there is an available market for the merchandise, the measure of damages is the difference between the contract price and the market price of the merchandise, at the time when the goods ought to have been delivered. See *Hoden*, 160 Pac. (2nd) 537.

Why Appeal

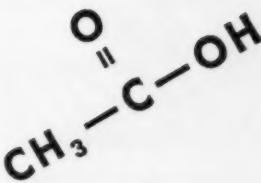
Modern higher courts consistently hold that litigants should not appeal to a higher court if the amount involved is small and insignificant.

For example, in *Standards Heating Company v. Reichert*, 25 N. W. (2nd) 87, reported January, 1948, the facts are that a written contract was entered into by a buyer and seller. Later the seller sued the buyer to recover damages for breach of his contract. The lower court held the purchaser liable to the seller for only \$75.

The purchaser appealed to the higher court which promptly approved the lower court's verdict, and said:

"Counsel must have known that even if his client were to prevail, nothing would be gained in a financial way, and that was the only thing involved. To encourage or even to permit appeals of this type is no help. . . Cases like this create bitterness and hostility, and the prosecution of them is likely to intensify rather than lessen such a feeling."

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Celanese* Glacial Acetic Acid, with a purity greater than 99.5%, is now being made available to a much greater portion of American industry. The high quality of this chemical makes it ideally suited for applications in pharmaceuticals, textile treatment and in organic syntheses. This versatile acid is also used in the production of acetate esters for the varnish and lacquer industries.

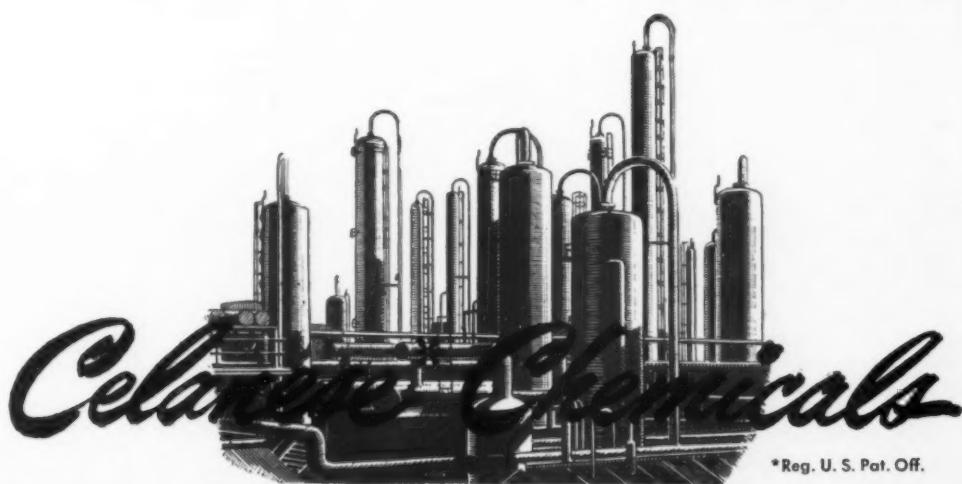
Water Content	0.5% by weight, maximum
Freezing Point	15.6° C., minimum
Specific Gravity	1.050 to 1.055 @ 20/20° C.
Color	Water White
Formic Acid Content	0.2% by weight, maximum
Non-Volatile Matter	0.001% by weight, maximum
Iron Content	1.0 PPM by weight, maximum

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DIAL BORE GAGE



NILCO dial bore gage is a visible control indicator for rapid, accurate measurement of small internal diameters. The dial indicator quickly reflects the size and condition of a hole. Total weight of the gage is 8 oz.

The dial indicator has graduations in .0001 with a total travel of about .008. Three gages will cover a range of $\frac{3}{8}$ " to $\frac{7}{8}$ ". Maker claims it is the fastest setting dial bore gage on the market. Literature available. Nilsson Gage Co., Inc., Poughkeepsie, N. Y.

NEW STEEL STRAPPING TOOLS

STEEL STRAPPING TOOLS

Two new strapping tools, the Stretcher (B2AO) and Sealer (C2A) provide the means of applying flat steel strapping to packs where strapping operating surface is very limited. The use of the tools for insulation work and for bundling and tying units of small diameter is claimed to be unlimited. Maker states they have been successful in applying a tight strap around packages as small as 1" in diameter. Strapping Division, Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill.

FLOOR-TO-FLOOR CONVEYOR



INCLINED: Sage floor-to-floor conveyor is of slider-bed type construction complete with nosed-over delivery tail feeder. Standard units are built with 8" to 24" wide, 3 ply, 28 ounce duck ruff-top rubber-covered belt. The conveyor is furnished with gear head motor and 25 ft. of rubber-covered cord. All work is completed at the factory and installation takes approximately one to two hours, according to manufacturer. Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.

OIL RESISTANT METAL LACQUER

NO. 5062 metal lacquer is said to be useful where oil resistance, toughness and maximum adhesion are required. It will withstand 24-hour immersion in gasoline and 15-minute immersion in hot oil (275°) with no apparent deterioration in film strength or gloss, maker states. The coating is said to have excellent adhesion to a variety of metal surfaces. Dennis Chemical Co., 2701 Papin St., St. Louis, Mo.

DOUBLE PURPOSE PUNCH



DI-ACRO punch can be used for rapidly perforating holes of various shapes and sizes as large as 4" in diameter, and as a precision punch for an unlimited variety of blanking, drawing, embossing, and forming operations. Roller bearing cam converts a small amount of operator effort into great pressure at the point of impact. Triangular shaped ram cannot be twisted or turned, thereby positively controlling position of the punch head. O'Neil-Irwin Mfg. Co., 305 Eighth Avenue, Lake City, Minn.

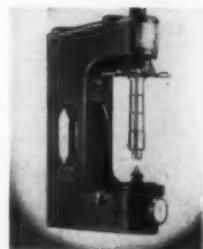
BRONZE ALLOY FOR FORMING DIES

ALUMINUM bronze alloy for use in forming and drawing dies, known as Ampco, Metal Grade 24, is said to have hardness coupled with high compressive strength and unusual wear resistance. The new material has two to five times the life of other bronze dies before redressing and many times the life of steel dies, according to the manufacturer. Ampco Metal, Inc., 1745 S. 38th St., Milwaukee 4, Wis.



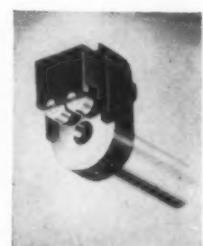
HARDNESS TESTER

SUPERFICIAL hardness tester, for Rockwell testing, is designed for surfaces that must not be marred, even by standard indentation. Depth of penetration is held to limits of .005" or less. The unit is suitable for testing surface hardened steel, exceptionally thin metals, rolled sheet metal, or very small areas. Available in three models, with 8", 12" or 16" vertical capacity. Clark Instrument, Inc., 10200 Ford Road, Dearborn, Mich.



HARD SURFACE PLASTIC SAFETY GOGGLE

SAFE-T-VIS safety goggle is made of an allyl casting resin, said to provide many times the surface hardness of any other plastic used for eye protection. One lens is claimed to be approximately one-half the weight of a case-hardened glass lens, making for greater comfort. Available in four goggle styles and in a selection of sizes. Literature available. The Univis Lens Co., Dayton 1, O.



ROLLER REST

ILLUSTRATION shows Model RR roller rest, which is said to replace the solid support. According to the maker, it eliminates the marring of piece parts and wear that cause variation in diameters. Individually adjustable rollers permit closer tolerances over long runs. Shank is tapped to permit adjustment of stop, drill or reamer without disturbing set-up of tool. Manufactured in two sizes, 00 and 0. Boyar-Schultz Corp., 2104 W. Walnut St., Chicago 12, Ill.

(Please turn to page 152)



lamp-matched ballasts

General Electric, major manufacturer of both lamps and ballasts, knows well how much lamp life and light output depend on the ballast. Overheat the lamp cathodes, or allow the lamp to flicker in starting—and life is shortened. Distort current wave form or let wattage fall—and light output is reduced. The ballast must be perfectly matched to the lamp. G-E ballasts are built that way. They're tested for matched characteristics—and their characteristics are permanent.

G-E ballasts are available for all types of fluorescent lamps—general line, circline, slimline instant-start, germicidal and cold-cathode.



Partners in Light

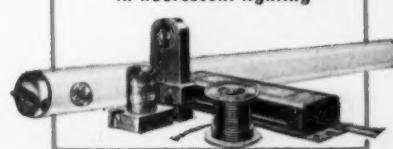
General Electric ballasts have permanent, uniform electrical characteristics, accurately matched to those of standard fluorescent lamps. These lamp-matched ballasts assure your customers of all-around "light satisfaction"—full rated light output and full rated lamp life. Specify General Electric ballasts for your fluorescent fixtures. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

GENERAL  **ELECTRIC**

412-64

SEPTEMBER, 1948

BALLASTS
CABLE
LAMPS
STARTERS
LAMPHOLDERS
for
DEPENDABILITY
in fluorescent lighting



151

DAMP-PROOF TRANSPARENT MASONRY COATING

water, leaves a transparent coating on porous masonry and common brick for protection against the absorption of water and dampness. It is non-inflammable and non-toxic, can be applied to either a moist or dry surface, and will not peel or dust off, blister or bloom, maker says. Ordinary painter's brush is used for application. *International Aquella Products, Rockefeller Center, New York, N. Y.*

SAFETY-AND-DRESS SHOE



"EXECUTIVE" shoe serves as safety shoe in the plant and dress shoe after hours. It has a heavy Chrotan outersole, oak middlesole, half-rubber heel with leather base, steel shank, Goodyear welt, and patented Lockrim steel toe box. It is said to solve the problem of getting men to invest in an "extra" pair of shoes for safety on the job. *Lehigh Safety Shoe Company, Allentown, Pa.*

PRODUCT DOUBLES QUANTITY OF PAINT

easier to apply, improve its consistency, and give it more elasticity. The paint will not separate or dry out while standing. It is not a thinner and can be used with the majority of paints now on the market, according to the manufacturer. Available in 1 and 5 gallon cans and in 50 gallon barrels. *Kay-Tite Co., West Orange, N. J.*

DOUBLE END TRUCK



GENERAL purpose double end truck is built of seasoned hardwood, and has a platform 52" long by 27" wide. It is completely metal bound. Steel end racks, with push handles, are 36" from the floor. Four 6" by 2" caster wheels, two swivel and two rigid (may be obtained with rubber or metal wheels). Weight is approximately 150 lbs. *Palmer-Shile Company, 12625 Mansfield Avenue, Detroit 27, Mich.*

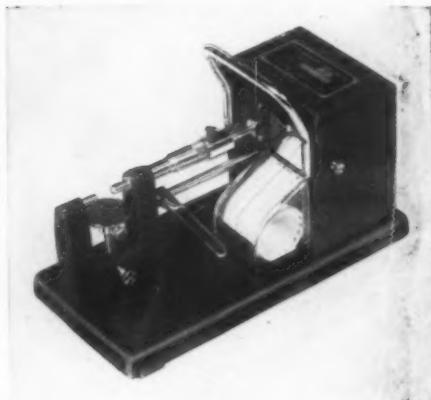
AQUAPHANE is an opaque water emulsion of a semi-plastic nature, which, upon evaporation of the

FORK TRUCK HOPPER DEVICE

SELF-DUMPING hopper attachment for all Lewis-Shepard gas or electric power fork trucks is for handling all kinds of bulk material such as coal, small castings, scrap metals, etc. Operator completely controls discharge of materials without leaving his position. After load has been dumped, the hopper returns itself to normal position and latches in an upright position. Hopper is furnished in a range of cubic feet capacities. *Lewis-Shepard Products, Inc., 282 Walnut St., Watertown 72, Mass.*



RECORDING GAGE



MODEL 500 automatic dimensional recording gage makes a rapid, accurate check of the dimensions of production parts and gives a permanent record. The continuous tape is ruled off in increments of thousandths and half thousandths of an inch. The instrument, which can be used easily by unskilled operators, warns the operator before parts are outside limits. It normally has a range of 0 to 1" and will check within limits of minus .003" to plus .003". The chart is capable of recording 35,000 measurements without change. *Federal Products Corp., 1144 Eddy St., Providence, R. I.*

CENTRAL POWER UNIT



ROTO-TABLE provides central power for a variety of hand-cranked tools and machines, eliminating expense of powering each tool and machine individually. It is suitable for sheet metal shops, machine shops, leather working shops, etc. Forty-two inches in diameter, the table rotates around a central shaft to which is attached an electric motor-driven gear box. Spring-loaded arm having universal joints and sockets at each end connects the drive unit with machines. *Roto-Table Co., 2605 E. Third St., Dayton, O.*

WATER-SOLUBLE CUTTING OIL

FEROX is described as an economical cutting oil which eliminates the need of further rust prevention treatment for tools, materials, and machinery. For most metals it is used one part to 49 parts clear water. On cast iron and malleable iron, one part to 33 parts of water. For threading or polishing, one part to 35 parts water. The solution remains completely clear at all times, because soaps and alkalies are not used. *Beacon Rust Proofing Co., 19 W. 31st St., New York, N. Y.*

REDESIGNED DRILL DRIFTS

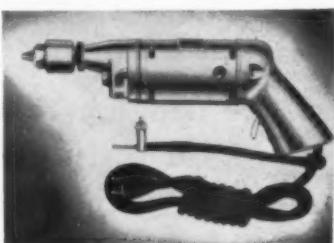


IMPROVED drill drift has a shoulder, or flange, on the head end. The drift is said to be less damaging to babbitt hammers, and a more direct, solid driving force can be applied to the enlarged end. Mushrooming is retarded because of the added metal. The enlarged end prevents the drift from flying through the spindle slot, eliminating danger of someone being hit. *Cleveland Twist Drill Co., 1242 East 49th St., Cleveland, O.*

SKID DUMP FOR USE WITH LIFT TRUCKS

MODEL MF-1 skid dump, for use on fork or platform lift trucks, has a capacity level full of 24.1 cu. ft. or .9 cu. yds. Capacity with surcharge is 30.25 cu. ft. or 1.11 cu. yds. Said to be durable, long-wearing, and easy to operate, it is used for hauling and dumping of scrap, sand, stamped parts and other industrial products. Formed channel legs, heavy duty welded undercarriage, and hopper of 3/16" steel plate add strength. Bulletin available. *Phillips Mine & Supply Co., 2227 Jane St., Pittsburgh 3, Pa.*

PORTABLE ELECTRIC DRILL



MODEL No. 250, lightweight 1/4" portable electric drill has a pistol grip handle with Cutler-Hammer trigger switch. It is supplied as standard with a Jacobs key-type chuck. Air cooled motor is of the universal type a-c, d-c, 110-115 volts. The drill is supplied with a 6', rubber-covered cable and attachment plug. Bulletin available. *Portable Electric Tools, Inc., 255-259 West 79th St., Chicago 20, Ill.*

(Please turn to page 154)

FOR SAFETY'S SAKE . . . USE CONDUIT (Full Weight Rigid Steel)

Rigid steel walls for permanent protection

RIGID steel conduit is the only wiring system approved by the National Electrical Code as moisture-, vapor-, dust-, and explosion-proof in hazardous locations.

Specify and use "Buckeye," the world's largest selling, standard-threaded, full-weight, rigid-steel conduit, and you insure permanent protection for wiring in any location.

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BUCKEYE CONDUIT

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Manufacturers of Carbon, Alloy and Yoloy Steel

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The Dependable B-Right-On Socket Screw Products line includes Hollow Set Screws, Socket Cap Screws, Hollow Pipe Plugs and Stripper Bolts.

Production runs solicited.

Dealers—Our large, complete and centrally located stock is at your service. Investigate this fast-moving, profitable line.

We have completely revised our list prices and sizes carried in stock. We will be pleased to send you a copy of this new list on request.

THE BRIGHTON SCREW & MFG. CO.

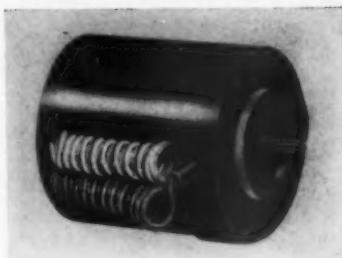
1845 Reeding Rd.
Cincinnati 2, Ohio

Brighton
SOCKET SCREW PRODUCTS



Special Low Head Cover Plate Screw

MINIATURE DRAG CUP MOTOR



KOLLSMAN miniature drag cup motor, weighing only 7.6 oz., has standard application as a follow-up motor and can also be applied where motors have not generally been used. Special features include the ability to reverse completely in .1 of a second, fast starting and stopping characteristics, maximum torque at stall, and continuous operation under stall conditions without overheating. One type runs at 3000 rpm and operates at 115 volts 60 cycles, the other runs at 5000 rpm and operates at 115 volts, 400 cycles. *Kollsman Instrument Div., Square D Co., 80-08 45th Avenue, Elmhurst, N. Y.*

**OSCILLATING
TROUGH
FEEDER-
CONVEYOR**

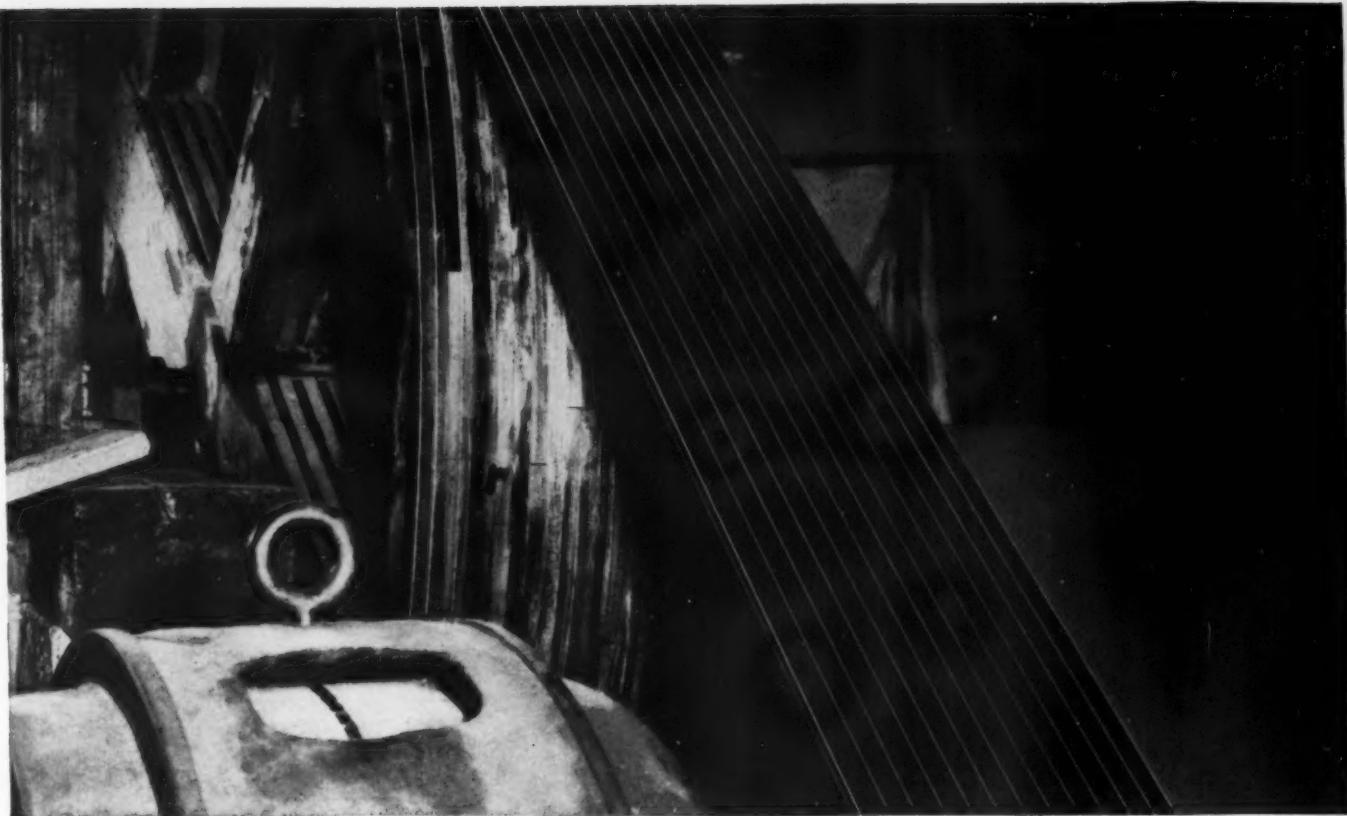
"PA" oscillator is a positive-action, roller bearing, eccentric type oscillating trough feeder-conveyor, driven by a Link-Belt electrofluid drive through a chain or V-belt reduction to the machine's eccentric shaft and connecting rod assembly. It is available in standard trough widths of 12 to 48 inches to suit the capacity desired and character of the material to be handled, and in single trough lengths of up to 100 feet. The oscillator trough is supported on a series of short arms and adjustable torsion bars, having the effect of reactor springs. Book No. 2244 available. *Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.*

AUTOMATIC TACKER



ALL STEEL, automatic, one-hand operated device called the Trojan Tacker, weighs only 2 1/2 oz. but is said to withstand rigorous usage. It will handle 1/4", 5/16" or 3/8" staples. By swinging aside the tension spring and changing the front plate, the tacker can be made to handle either .025 or .050 gauge wire staples. Pressing handle releases leverage which drives the twinpoint staple tacks into soft or hard wood or through thin metal. Useful in confined spaces where a hammer can not be used. *The E. H. Hotchkiss Company, Norwalk, Conn.*

(Please turn to page 156)



Saves \$1,200 a year on "Crack-the-Whip" Drive

"Cracking the Whip" is fun for the riders of a Pennsylvania Amusement Park, but it's one of the toughest drive applications. The fast starts, rapid accelerations and sudden stops cause ordinary belts to slip...burn and wear through.

Take the case of this Park Owner. During the 1946 park season, his "Whip" wore out 3 of the 40-foot, original-type belts. He had to replace them at a cost of \$400 each.

Then he called the Dayton V-Belt Distributor. His problem was studied. The power, speed and space limitation

analyzed. Recommendation: Use the old wood-flat driven pulley, install standard Dayton V-Belts and Dayton Motor V-Pulleys. Nothing "special" required. Result: After two years, no slippage, no burning, no wear through. \$1,200 a year saved.

When it comes to transmitting power, Dayton's can do it better and save you money. Your local Dayton V-Belt Distributor has specialized knowledge and complete stocks.

For a better, more profitable solution to your drive problem, call your local Dayton V-Belt Distributor.

THE DAYTON RUBBER COMPANY

Main Office and Factory: Dayton 1, Ohio

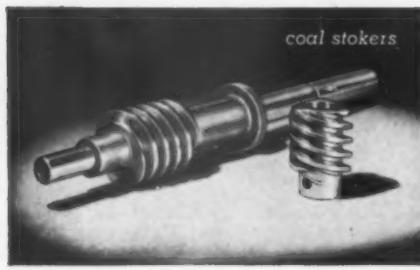
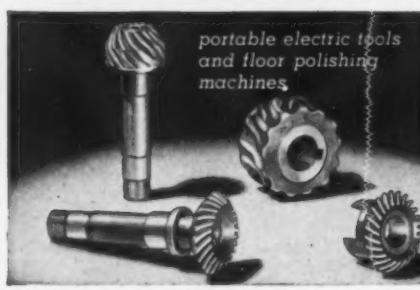
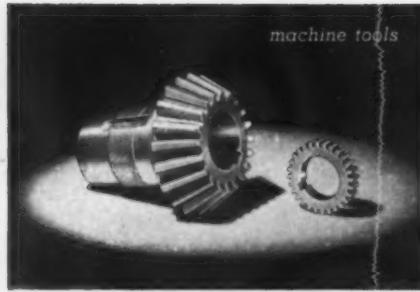
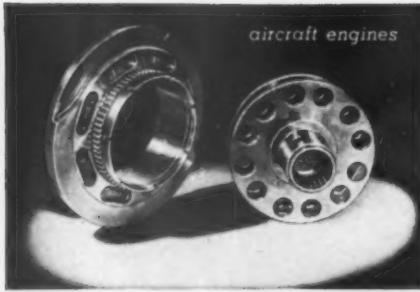
Branch Offices: Atlanta, Boston, Chicago, Cleveland, Dallas, Detroit, Los Angeles, Minneapolis, New York, Philadelphia, St. Louis



V-Belt Buyers! A leading mill supply house near you offers specialized Dayton V-Belt service. Look for the name under the trade name heading "Dayton V-Belts" in the yellow pages of your telephone directory.

Dayton Rubber

THE MARK OF TECHNICAL EXCELLENCE IN NATURAL AND SYNTHETIC RUBBER



Typical Examples
of PERKINS
custom-cut GEARS

FOR A REPRESENTATIVE
NUMBER OF
MANUFACTURED PRODUCTS

We have specialized in the mass production of precision gears to customers' specifications for nearly 30 years. Our equipment, facilities and experience enable us to fill orders for any type of gear in any quantity and material—metallic or non-metallic. Once your specifications are in our files, re-orders are filled automatically. Let us quote on your requirements now.

YOU FURNISH THE SPECIFICATIONS — WE'LL PRODUCE THE GEARS

PERKINS Precision, Custom-Cut

PERKINS MACHINE & GEAR CO., Springfield 2, Mass. GEARS

AMPERE-DEMAND METERS

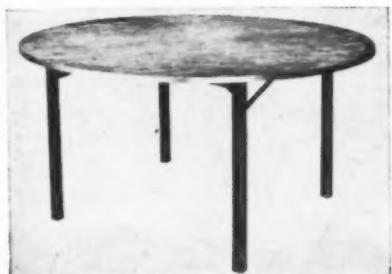


THERMAL ampere-demand meters, built into the same case with standard watt-hour meters, are compact units that can be used by the utilities on single-phase or polyphase systems for certain types of industrial and commercial installations where kva demands are incorporated into the rate. Five types are available for various types of service. Literature available. *Westinghouse Electric Corp., P.O. Box 858, Pittsburgh 30, Pa.*

INSECT
CONTROL
SYSTEM USES
ATOMIZER

OPERATED by air-pressure, steam pressure, or carbon dioxide gas pressure, the West atomizer disseminates a "dry" mist of insect killing droplets about eight microns in diameter. No condensation is noticeable. The unit has ten atomizing nozzles which dispense the insecticide into the upper and lower stratas of a room. The atomizer installation is tailored to fit any plant requirement. Detailed literature available. *West Disinfecting Co., 42-16 West St., Long Island City 1, N. Y.*

FOLDING ROUND TABLES



ROUND tables with all-steel chassis and easy-to-operate folding mechanism and lock are available in 54", 60" and 72" diameters. The legs are 1½" square tube steel with lapped seams. The tops are of ½" fir plywood, with a protective aluminum edge around the entire top. Standard height of the tables is 30". Literature available. *Howe Folding Furniture, Inc., 1 Park Avenue, New York, N. Y.*

(Please turn to page 158)

This shipper of heating equipment finds Signode steel strapping protection cuts damage loss.

**WHAT
THIS MAN
KNOWS ABOUT
SHIPPING —**



could improve YOUR Profit Picture!

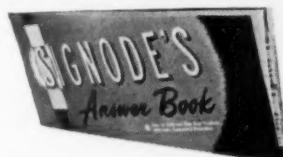
Back of many an improved packaging and shipping method, in all industries, is a Signode packaging and shipping engineer.

This man's job is to work with shippers of all kinds of products; to help them reduce damage claims; save time, money and materials—through the application of Signode's *System of Planned Protection*.

This time-proved system gives maximum protection to shipments in transit, permits single unit handling of multiple loads, speeds loading and unloading, stops the profit leaks in your shipping department.

To find out, without obligation, how you can benefit, write:

JUST PUBLISHED



Signode's "Answer Book"—24 pages of pictures and information on better packaging and shipping methods. Write for your free copy.



SIGNODE STEEL STRAPPING CO.

2602 N. WESTERN AVE., CHICAGO 47, ILL.

STEEL STRAPPING PROTECTS YOUR SHIPMENTS AGAINST DAMAGE

Ask for

Briggs & Stratton

Gasoline Engines

on the equipment

You buy

More and more Briggs & Stratton Engines are now available on all types of appliances and equipment than ever before.

BRIGGS & STRATTON CORPORATION

Milwaukee 1, Wis., U. S. A.



PORTABLE OIL FURNACE



COMPACT automatic oil furnace for commercial buildings has an Underwriters' Laboratories approved jet-type gun burner, the nozzle of which delivers 120,000 Btu's per hour at the bonnet. It has a free air delivery of 2,800 c.f.m. The furnace burns No. 3 grade oil or lighter. It is equipped with steel skids, for moving from building to building, and can be mounted in a low truck or trailer. Its design permits use as a space heater with the plenum mounted on the top of the furnace, or it can be connected to duct work. *Service Metal Fabricators, Inc., 2350 W. 58th St., Chicago 36, Ill.*

CHAIN TONG WRENCH TURNS PIPE RIGHT OR LEFT

NEW chain tong ratchet action wrench is instantly reversible, and has 25% greater chain wrap than ordinary wrenches, it is claimed. The chain is of a type that will not jam under pressure, maker states. The chain tong is suitable for handling pipe in corners, coils and banks, and any tight spots where other wrenches cannot operate. It is provided with an adjusting bolt for the job where a tight chain may be required. Catalog available. *E-Zee Tool Manufacturing Corp., 135 Liberty St., New York 6, N. Y.*

HYDRAULIC POWER UNITS



PACKAGED hydraulic power units, selling in the low price bracket, are suitable for applications where forming, bending, straightening, pressing, lifting, pulling and lowering are the operating factors. Known as the "Cubline", the units are available in 6, 10 and 15 gpm capacities. Each unit consists of a 35 gal. round oil storage reservoir with foot mountings; electric motor, 1000 psi gear pump; relief valve; coupling; pipe and fittings; suction hose and clamps. *The Hydraulic Press Mfg. Co., Mount Gilead, O.*

(Please turn to page 162)



NOW-for the first time ever- you can get all the G-E fluorescent lamps you want

HOORAY! Now you can fill those empty sockets, replace blackened or burned out lamps, go ahead with lighting modernization. Because, for the first time since General Electric introduced the fluorescent lamp 10 years ago, G-E fluorescent lamps are available in quantity.

WE'VE BEEN WORKING at top speed to build new factories, expand production to catch up with the ever-growing demand for the world's newest kind of light.

SO NOW AT LAST you can have all the general line

G-E fluorescent lamps you want. (Only slimlines and circlines are in limited supply). Get the advantages of increased efficiency and stepped up production that result from better lighting, properly maintained.

WHY NOT SEE your G-E lamp supplier today? Now he can really greet you with a great big smile and an armful of those G-E lamps—the lamps that most people want *most!*

ALWAYS INSIST ON



G-E LAMPS
GENERAL  **ELECTRIC**

SAVE 50%

ON YOUR COTTON BUFF WHEEL COSTS

JACKSON AIRWAY Ventilated BUFFS
now give you these important features

WEARS TWICE AS LONG - NO RAVELING - NO RAKING

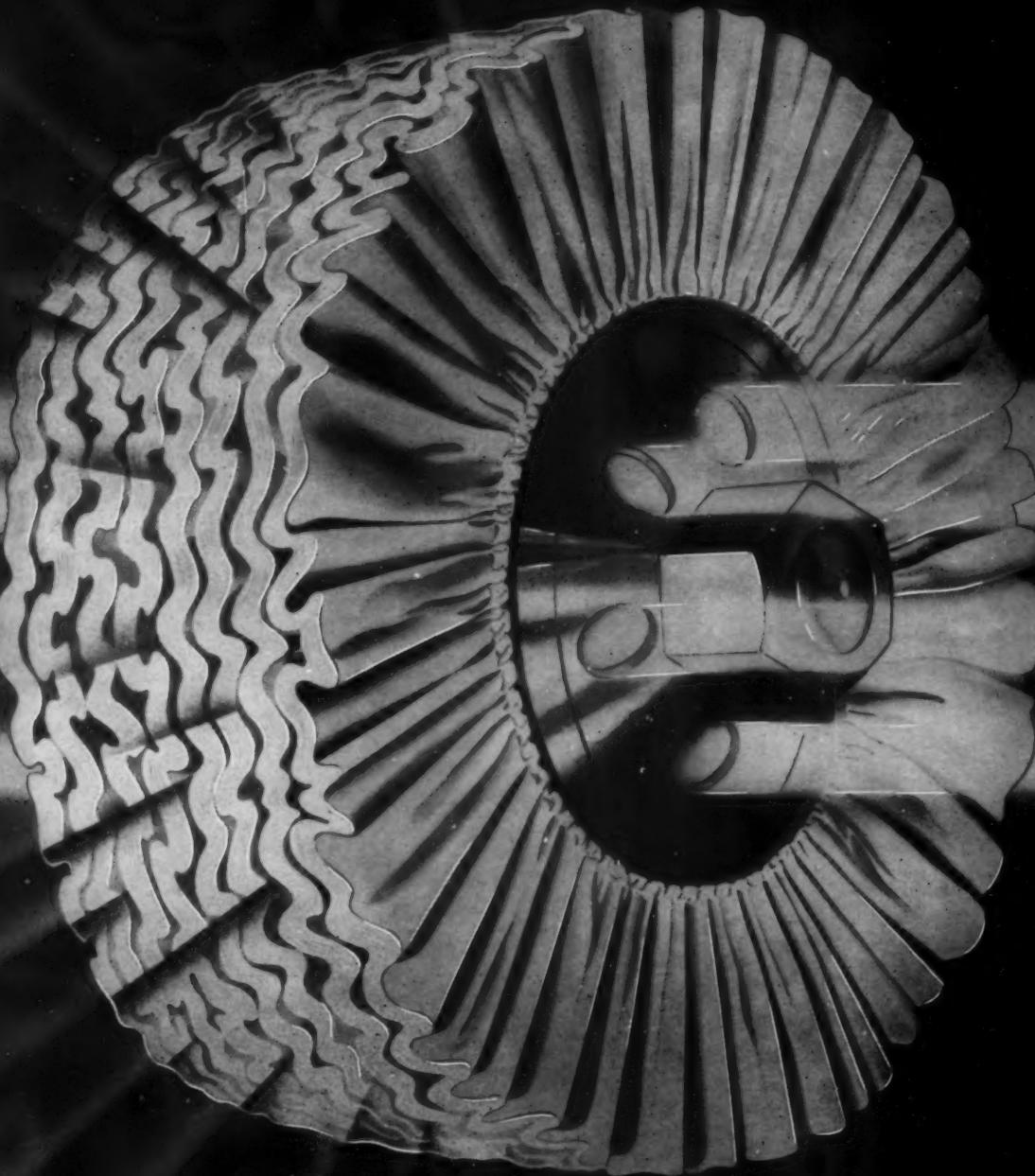
BURNING ELIMINATED - SAVES COMPOUNDS

FASTER CUTTING, DOES NOT RIDGE WORK

there is only ONE Jackson Airway Ventilated buff

Jackson Airway Ventilated Buffs produce better work faster . . . and at lower cost. They eliminate burning and ridging . . . save buffing compounds . . . wear twice as long . . . because Jackson patented construction incorporates full ventilation permitting air to cool the buff internally. Whether your buffing equipment is hand operated, semi-automatic or fully auto-

matic, comparative tests with ordinary buffs will definitely prove a 50% saving. The manufacturers of modern buffing machines specify Jackson Airway Ventilated Buffs for best results. Conclusive proof that Jackson Airway Ventilated Buffs will save you 50% is yours for the asking. Write, wire, or phone The Jackson Buff Corp., 21-03 41st Ave., Long Island City 1, New York.



WARNING NOTICE—Jackson Buff Corporation of Long Island City, N. Y., has rights to U. S. Patents Nos. Re. 19,894 and 2,140,208 which have broad claims covering an air cooled buff having means for the admission of air through the sides of the buff. Owner intends to protect all rights and stop infringement.

JACKSON BUFF CORPORATION

21-03 FORTY-FIRST AVENUE • LONG ISLAND CITY, N. Y.

Visit our booth #1710 at National Metal Exposition — Convention Hall — Philadelphia — Oct. 25-29.

THE CASE OF THE DOUBTFUL CONTRACT



METALITE* BELTS

*change profitless grinding
into valuable business*

This cutlery manufacturer couldn't figure any profit, using set-up wheels, in a proposed contract for rough and finish grinding sheath knives. Then he considered the belt backstand method with Metalite* Cloth Belts and saw how he could do it at a profit. Here's why:

OPERATIONS — Rough and finish grind all surfaces on sheath knives from rough steel forgings.

ORIGINAL METHOD — No previous production figures available but past experience with set-up wheel production costs indicated job could not be done at price demanded.

BELT BACKSTAND METHOD

BACKSTAND — Hammond Model 3.

CONTACT WHEEL — Behr-Manning Hard Density 12" x 4" x 1 1/4".

ABRASIVE BELTS — Metalite Cloth Durabonded 4" x 118".
Roughing — Grit #60 X Heavy Duty.
Finishing — Grit #100 X (greased).

IMPROVEMENT — Contract became profitable business.

1. Production volume 60% above "profit-level" estimate.
2. Production costs 45% below "profit-level" estimate.

REMARKS — Management extremely well pleased — requisitioned additional units immediately.

You can check the advantages of the belt backstand method with Metalite* belts right in your own plant. Write, phone or wire us for a free demonstration.



* Reg. U. S.
Pat. Off.

BEHR-MANNING • TROY, N. Y.

(DIVISION OF NORTON COMPANY)

THE BELT METHOD IS THE BETTER METHOD
... AND THE BETTER BELT IS METALITE

162

• LONG ISLAND CITY 5, NEW YORK
Vizit our booth — 1210 to 1210 at National Metal Exposition — Convention Hall — Philadelphia — Oct. 25 — 28, 1948

METAL CUT-OFF BAND SAW



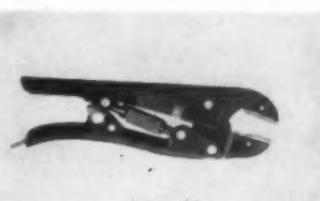
HORIZONTAL band saw is designed to cut-off metals up to a capacity of 5" x 10". The bed is 7" wide by 28" long, and set on a three-point base to insure that the saw is always supported free of torsional strain, and the accuracy unaffected by floor conditions. Stock stop gauge is supplied for duplicate cutting. The machine operates and shuts off automatically. There are three blade speeds: 45, 90, and 150 fpm. Johnson Manufacturing Corp., Room 658, Chrysler Building, New York 17, N. Y.

2,000-LB. FORK TRUCK



"THRIFTY Lift" 2,000-lb. fork truck is powered by a twin cylinder, air-cooled engine that develops a maximum of 10 hp. Lift and tilt mechanism is completely hydraulic. The unit is available with lifts of 7', 8' or 9' heights, and rubber cushion tires, 16" x 4" are standard equipment. The truck can change from forward to reverse without the operator touching the gear shift lever. Overall dimensions are: length less forks 63 3/8", width 32", wheelbase 33". Outside turning radius is 59". The Buda Co., Harvey, Ill.

VISE PLIERS



"GRIPSO" pliers feature finger-tip release, special jaw construction and double action adjusting screw. The tool can be adjusted quickly for ratchet or plier action. It can be locked and released with one hand, making it adaptable for use as a pliers, hand vise, nut wrench, pipe wrench or clamp, useful in hard-to-get-at places. Gripping range is said to range from light pressure to over a ton. Literature available. J. K. Bradford Co., 425 Second St., San Francisco 7, Calif.

(Please turn to page 164)

31-03 FORTY-FIRST AVENUE PURCHASING

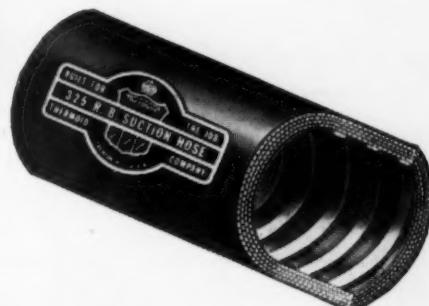
Thermoid Water Suction Hose

Made in a Type to Suit Every Job

Water Suction Hose is generally subjected to rough usage. Thermoid has studied carefully the service conditions under which it is used and has designed several types from which you can pick the one best suited to the job you have to do.

For the Toughest Kind of Duty Use Thermoid #325 Type

This hose is made in smooth or rough bore. Use smooth bore when sand, dirt or other abrasives are in the water to be handled. Use the more economical rough bore type when the water is free of abrasives. Each type has a high quality tube, strong wire reinforcing, then plies of specially woven duck with a weather and abrasion resisting cover. Supplied in sizes 1 1/4" to 6" in lengths up to 50 ft.



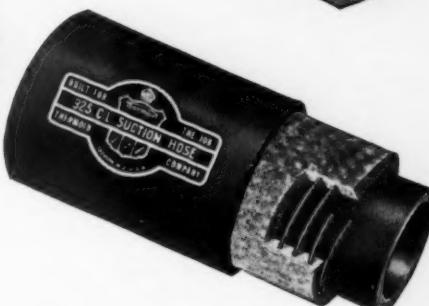
For Less Severe Service Use Thermoid #350 Type

Somewhat lighter in construction, but with plenty of long life quality for less severe jobs. This hose comes in smooth or rough bore, wire and duck reinforced, with weather and wear resisting cover. Supplied in sizes 1 1/2" to 6" and in lengths up to 50 ft.



For Normal Light Duty Use Thermoid Type #325-CL

It's an economical hose for normal light duty service. The water way is smooth, resistant to action of gritty particles, the reinforcement of high carbon steel wire interwoven with heavy cotton yarn, cover of sufficient thickness and strength to resist abrasion and rough handling. Furnished in sizes of 1 1/2" to 6", in lengths up to 50 ft.



Other types of Thermoid Suction Hose include Oil Suction, Sand Suction, Agricultural, Hard Rubber and Fire Engine. Catalog information on request.

The Thermoid line includes: Transmission Belting • F.H.P. and Multiple V-Belts • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Custom Molded Products • Industrial Brake Linings and Friction Materials.

Thermoid
Company

Main Offices and Factory • Trenton, N. J., U. S. A.

Western Offices and Factory • Nephi, Utah, U.S.A.

Industrial Rubber Products • Friction Materials • Oil Field Products

3 HANDEES COVER the FIELD

TOOLS OF 1001 USES GRIND, DRILL, POLISH,
ENGRAVE, CUT, CLEAN, SAW, CARVE, etc.

For work on metals, alloys, wood,
plastics, stone, horn, bone, etc.
Plugs in any AC or DC socket.

HANDEE 44

A good production tool. Has everything — speed, power, versatility and pencil-point precision. Constantly cooled by forced air, the 44 runs cool and smooth all day long. Weighs 2 lbs., 8½" long, 20,000 r.p.m. \$31.50. In wood carrying case with accessories \$42.50.

HANDEE Hi-Power

A big fellow. Fast, powerful, sturdy, for continuous work. Has ample power to drive a 2½" diameter wheel. Weighs 3 lbs., 10" long, 17,000 r.p.m. In case with assortment of accessories \$42.50.

HANDEE

First tool of this type and today's finest. For precision work. Also gets into hard-to-reach places to make repairs on machinery. Weighs 12 oz., 6½" long, 25,000 r.p.m. With 7 accessories \$20.50. Handee with 40 accessories in carrying case \$27.50.

CHICAGO ACCESSORIES

Grinding and mounted wheels, sanders, steel cutters, etc.—the most complete line to fit any power tool—over 500 of finest quality—all made in our own plant.

Send Handee 44 Name _____
 Hi-Power _____

CHICAGO WHEEL & MFG. CO., 1101 W. Monroe St., Dept. PG, Chicago 7, Ill.

Handee
 Remittance enclosed Address _____
 Send C.O.D.
 Send Catalog



Handee Tools and Accessories
are in stock in principal industrial areas. Write for Catalog.

TUBING HAND TRUCK



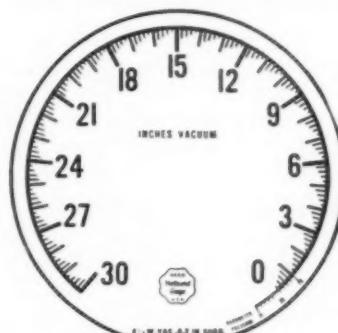
ROL-AWAY hand truck for handling pipe tubing, bar stock, rods, molding, lumber, etc. is made of welded aluminum tubing and has 4 steel casters which enable it to roll in any direction. It is 6' long, 24" wide and 34" high, and can be operated easily in aisles. The truck has a stretcher or shelf under the U-shaped tubing rack for holding packages or smaller pieces. Beall Pipe and Tank Co., 1945 N. Columbia Blvd., Portland 3, Ore.

55-GAL. OIL DRUM GAGE



OIL gage for 55-gallon drums is described as being accurate, practically indestructible, and suitable for use indoors or outdoors. It is comprised of clear plastic tubing containing red cork float and marked with 5-gallon red numeral calibrations; rustproof bracket and bolt for securing to top rim of drum; and brass cap and screen air vent to safeguard against fire and dirt. Fits standard 55-gallon drums with ½" leeway for possible variation. Mastercraft Products, 60 South Street, Boston 11, Mass.

VACUUM GAGE DIAL

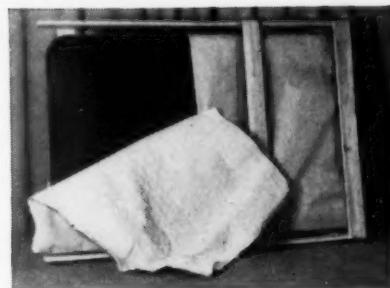


THIS vacuum gage dial is graduated 0 to 30" mercury vacuum in .2 of an inch increments, and with barometric pressure reading from 29" to 31". The gage may be corrected for changes in barometric pressure, assuring more accurate readings, by means of the external micrometer pointer adjuster. The dial reads counter clockwise to prevent confusion with a pressure gage. Helicoid Gage Division, American Chain & Cable Co., Bridgeport 2, Conn.

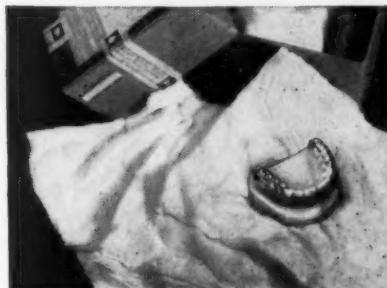
(Please turn to page 160)



Air-flown flowers arrive garden-fresh. That's because they're insulated with protective KIMPAK. Insulation Packaging Photo courtesy of United Wholesale Florists of Calif., Inc.



Surface Protection — Table top. Photo Courtesy Drexel Furniture Co.



Flotation Packaging — Dental Model. Photo Courtesy Kramer Dental Studio.

Kimpak* Float Packaging

cradles your products...protects your profits

Don't let shipping damage claims eat away your profits! Cushion every product you package with soft, strong KIMPAK* creped wadding. For KIMPAK provides low-cost protection from shipping room to journey's end.

It is amazingly versatile. Clean and grit-free, KIMPAK safeguards a wide variety of items...from delicate glass to hardy machine parts. Keeps its resiliency under continuous shock and vibration. And light in weight, compact, it adds little bulk to shipments.

KIMPAK is popular with packaging

personnel. It is pleasant to handle, clean, and takes up a minimum of storage space. What's more, fleecy-white KIMPAK enhances the sales appeal of any product—it's that good looking.

You may choose from a number of thicknesses, backed or unbacked, liquid-repellent or liquid-absorbent—sheets, rolls, or pads. In fact, there is a specification of reliable KIMPAK to meet every requirement of the Four Basic Methods of Interior Packaging...Surface Protection, Flotation Packaging, Blocking and Bracing, and Absorbent Packaging.

Free booklet on better packaging methods. Call or write your local distributor for the illustrated KIMPAK book on how to improve your present packaging. He is listed in the Classified Directory. If you prefer, simply mail this coupon.

• • • • •
KIMBERLY-CLARK CORPORATION
Creped Wadding Division, Neenah, Wis.
Please send me the free KIMPAK booklet that tells how I may better my packaging methods.

P-948

Name _____

Firm _____

Type of Business _____

Address _____

City, Zone, State _____

Kimpak
REG. U. S. PAT. OFF. & CAN. PAT. OFF.
FOREIGN COUNTRIES
CREPED WADDING



*T. M. Reg. U. S. & Can. Pat. Off.

Years of shelter



built in a day

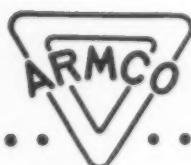
It takes only a few hours to erect a Standard ARMCO STEELOX Building, and you have a strong, sturdy structure that will last for years and years.

The unique STEELOX joint does the trick. Individual panels go into place like magic to provide both structural support and finished surface. For sidewalls they save framing and outside covering. On the roof they replace rafters, sheathing and roofing. Erection is simplified, costs go down, and weathertight construction is assured.

But these are only a few of the advantages. With all their strength, STEELOX Panels are light and easy to handle. One or more unskilled workmen quickly make a strong, tight, fire-resistant structure that combines all the advantages of a permanent building with high salvage value. STEELOX Buildings can be quickly dismounted and re-assembled on another site.

You can get prompt delivery on Standard ARMCO STEELOX Buildings for utility buildings, garages, offices, warehouses or wherever else you need an easily-erected, permanent or temporary structure. Mail the coupon for prices and complete information. ARMCO Drainage & Metal Products, Inc., 2405 Curtis Street, Middletown, Ohio.

Export: The Armco International Corporation



ARMCO STEELOX BUILDINGS

ARMCO DRAINAGE & METAL PRODUCTS, INC.

Send me data on Standard ARMCO STEELOX Buildings for the following use

Name _____

Street

City

500

CONVEYOR TABLE



ISLAND "unitized" conveyor table can be used as a work table, for assembling, inspecting and conveying. It has standardized parts which are interchangeable, eliminating drilling and fitting. Leg supports are also standard and fit any of the company's tables. The tables can be coupled to form as long a unit as desired. The unit is made in different lengths and in 11 widths. Bulletin IP-1 available. *Island Equipment Corp., 101 Park Ave., New York 17, N. Y.*

DEVICE FOR
HANDLING
FLAT SURFACE
ARTICLES

DEVICE FOR HANDLING FLAT SURFACE ARTICLES

"STRONG finger grip" device for truck drivers to use in unloading, or for shop men to handle sheets, plates or other flat surface articles, is 6" long and $3\frac{1}{2}$ " wide. A handle bar permits it to be carried between the first and second fingers. One man can clip the grip on to a sheet and extract it from a pile. The clamp can be furnished with an eye in place of the hand handle to attach it to conveyor system or mechanical lifting arrangement. *Merrill Brothers, Maspeth.*

TRIPLE-PURPOSE HAND TOOL



POCKET-SIZE tool, known as the "Shearite", is said to cut off without damage to threads any of the four sizes of machine screws most used in electrical work (#10-32, #8-32, #6-32 and #4-40). It will strip wire in a wide range of sizes (22 to 10), and also cut wire. It is made of high strength alloy steel, and is fitted with shock-proof plastic handles. *Aircraft-Marine Products, Richard Renner Associates, Dept. 1575, 315 South 15th St., Philadelphia 2, Pa.*

(Please turn to page 168)

Solve these industrial heating problems with Westinghouse heaters that "take over the job"

- warming and drying cabinets
- industrial hot plates
- electroplating baths
- mineral, oil, paraffin or alkaline solutions
- hydraulic press platens

The complete line of Westinghouse industrial heating units—strip, cartridge and immersion—offers the solution to your industrial heating problems for solids, liquids or air.

These heaters provide economical, dependable heat-concentrated where it is needed to do the job. They are quickly and easily installed and, in many cases, can be added to supplement existing equipment. Check your own production for trouble spots where these units can give the answer to heating problems.

Get your copy of the new Catalog 28-020. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.



Reach Those Hard-to-Heat Spots with Westinghouse Electric Air Heaters

Don't let cold crane cabs, isolated offices, shipping rooms and elevators cut your employees' working efficiency this winter. Westinghouse electric air heaters—either convection or fan type—provide quick, clean heat with no danger of scorched walls or annoying odors. These heaters from the Westinghouse complete line are immediately available. Call your nearby Westinghouse office or distributor for complete information.

J-10338



YOU CAN BE SURE
IF IT'S
Westinghouse



Westinghouse HEATERS AND CONTROL

PLANTS IN 25 CITIES... OFFICES EVERYWHERE

MATERIAL HANDLING News



Orderly tiering of palletized cartons to the ceiling or cold storage rooms is routine for the Elec-Clipper



Unloading material from a delivery truck with the Elec-Clipper cuts the truck's standing time, simplifies checking of shipments, speeds the movement of material



Hustling unit loads from the warehouse and quick assembly of shipments by means of the Elec-Clipper cut handling costs to the minimum

"King's size for usefulness, Pint-size in cost"

ELEC-CLIPPER

is the versatile electric battery-powered fork truck for that multitude of handling jobs defined as "loads up to 2,000 pounds"

Potent combination of versatile utility and attractively small cost, Clark's Elec-Clipper has done an exceptional job for industry in handling materials weighing up to a ton. In the many branches of the food industry, and particularly in wholesale distribution outlets; in foundries and metal working shops, automobile plants, railway storehouses and freight depots; in truckers' freight stations and warehouses of all kinds; in all these and many other varied installations, electric battery-powered Clark Clippers enjoy admiration and respect.

With 124-inch lift on the standard high-lift model, and over-all height of only 83 inches with forks lowered, the Elec-Clipper moves comfortably and safely under 7-foot clearances, and does high tiering with amazing ease.

Finally, it costs less—a clinching benefit: less in initial investment, less to maintain, less to operate—by testimony of delighted users. That benefit is a natural result of Clark's unrivaled automotive experience and of Clark's own quantity production of nearly all component parts. It's a better machine—husky, dependable, economical—because *Clark builds it*.

To get a wholly objective survey of materials handling operations and needs in your business, talk to a Clark field representative—a competent man whose recommendations are unbiased because *Clark builds both types of machine, gas-powered and electric battery-powered*. As basic "good business" **CONSULT CLARK**.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS



INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT COMPANY BATTLE CREEK 23, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD
AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

"THE NATIONAL GUARD DEFENDS AMERICA—JOIN NOW"

ACCORDION CONVEYORS



ILLUSTRATION shows four accordion conveyor sections, two set up together with a power belt, each of which expands from 3 to more than 10 feet. Sections can be easily handled by one man, maker states, and have legs adjustable to permit gravity rolling of products. They are capable of bending 180° in either direction. Products may be sent around corners without danger of falling off, due to divided rollers, it is claimed. *Food Machinery Corp., Riverside, Calif.*

TOOL BOXES

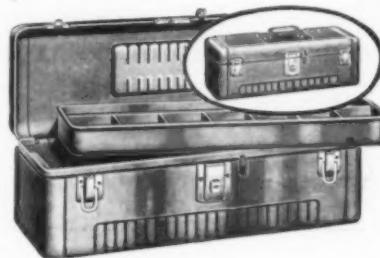
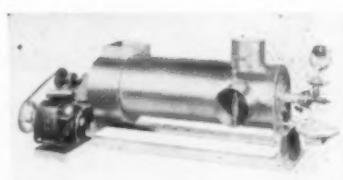


ILLUSTRATION shows deluxe model tool box, T-3019, with recessed hardware and full-size lift-out tray. Other models include: heavy duty type, of rugged construction with reinforced corner irons, leather handle and lift-out tray; roomy 22" tote-tray model with folding handle on the tray; and chest equipped with two full size lift-out trays and many sections that are adjustable, and finished in gray enamel. *Master Metal Products, Inc., Buffalo 4, N. Y.*

HEATER UNIT "PACKAGE"



INDUSTRIAL Midget utility air heater unit comes as a "package", including heater, fan, motor, drive, safety devices and temperature controller. It is direct fired and said to be useful for heating drying rooms and small industrial ovens. With a heating capacity of 125,000 Btu, it is suitable for temperatures up to 350 F. The fan capacity is 10.0 cu. ft. of air per minute. The hot air can be recirculated for greater fuel economy. *Gas Appliance Service, Inc., 1211 Webster Ave., Chicago 14, Ill.*

(Please turn to page 172)

for downright
packaging economy-



and Added Sales!



A paper clip is a handy gadget for holding things together. For instance, you might clip together your complete packaging costs from original product handling right through to counter display and retail wrapping. Then compare these costs with the custom built economies you would have if your container was a set-up paper box.

You'd find the set-up box is custom built for ease of packaging, product pro-

tection, greater display value, better point-of-sale preference — and frequently needs no secondary retail wrapping. Add the costs—or the savings—and you'll find for general economy no other package better fits your sales and packaging program.

Ask your nearest Set-up Box manufacturer to show you his ideas on improving your product sales through better — more economical — packaging.

FOR INFORMATION OR SERVICE • CONSULT
YOUR NEAREST SET-UP BOX MANUFACTURER



**NATIONAL
PAPER BOX
MANUFACTURERS
Association**

AND COOPERATING SUPPLIERS
Liberty Trust Building, Philadelphia, Penn.



MIDWEST WELDING FITTINGS IMPROVE PIPING DESIGNS

Many large users of pipe welding fittings report that Midwest Welding Fittings save them important time . . . and money . . . because of their unusual accuracy to published dimensions and their exceptional uniformity. These advantages did not just happen . . . they are direct results of the unique Midwest manufacturing methods.

But savings in time and cost are not the only advantages offered by Midwest Welding Fittings. Simplified and improved piping design is also often possible. For example: the Midwest Reducing Elbow (available in sizes through 12") decreases pressure drop and turbulence when used instead of a standard elbow and reducer (it also saves more than $\frac{1}{3}$ of the welding). Midwest Long Tangent Elbow removes weld from point of maximum bending stress and is designed to permit use of slip-on flanges. Midwest Saddles compensate for weakening of header body resulting from metal removal for nozzle opening. Midwest Sleeves relieve butt welds of bending and tensile stress. There is a distributor near you . . . it will pay you well to call on him for your welding fitting requirements.

MIDWEST PIPING & SUPPLY CO., Inc.

Main Offices: 1450 South Second Street, St. Louis (4), Mo.

Sales Offices: New York (7), 30 Church St.

Chicago (3), 79 West Monroe St. • Los Angeles (33), 520 Anderson St. • Houston (2), 229 Shell Bldg. • Tulsa (3), 533 Mayo Bldg. South Boston (27), 426 First St. • Distributors in Principal Cities.

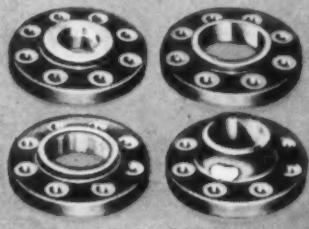
4 PLANTS ARE
BETTER THAN 1



LAP-JOINT STUB ENDS



REDUCERS



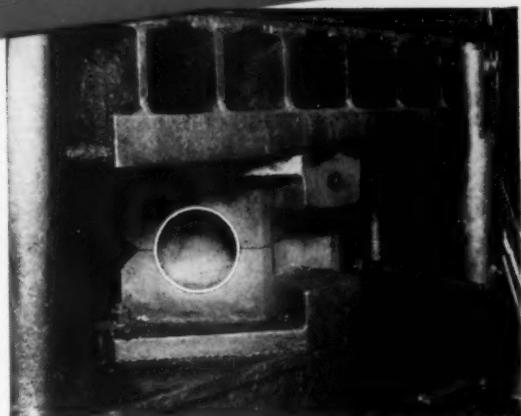
FLANGES



SADDLES

AND REDUCE COSTS . . .

Here's Why TIME IS SAVED

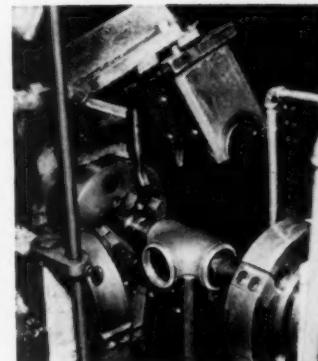


SIZING IN COMPRESSION

Midwest Elbows are first made slightly oversize. They are then reheated to forging temperature and brought to final size in compression dies. In addition to relieving forming and welding stress, this assures true circular cross section, uniform wall thickness and accurate radius, included arc and tangents.

SPECIAL MACHINING

Special machines developed by Midwest simultaneously bevel the ends of Midwest Welding Fittings. This assures exact included angles and holds center-to-end dimensions well within tolerance specifications.



FINAL INSPECTION

Every Midwest Welding Fitting is individually checked to insure that the high standards of precision are maintained.

How to put faraway suppliers close to "home"



What if suppliers are thousands of miles away? When you specify Air Express, you cut down delivery of equipment, supplies and finished products to a matter of hours. Air Express is the *fastest service* there is. Remember—large inventories are expensive. You can keep them low by getting what you need in hours.

Air Express goes on every flight of the Scheduled Airlines—places the most distant suppliers only hours away. And you get fast pick-up and delivery service at no extra cost. Rates are *low*. Use Air Express regularly and keep things hustling.

Specify Air Express—World's Fastest Shipping Service

- Low rates—special pick-up and delivery in principal U. S. towns and cities at no extra cost.
- Moves on all flights of all Scheduled Airlines.
- Air-rail between 22,000 off-airline offices.

True case history: Sacramento, California, dairy regularly gets replacement parts and equipment by Air Express. Keeps inventory low—gets things in hours. Typical shipment: 32 lbs. of parts picked up in Detroit 7 P.M., in use at Sacramento next afternoon. 2039 miles, Air Express charge \$19.65. Any distance similarly inexpensive. Phone Air Express Division, Railway Express Agency, for fast shipping action.

AIR EXPRESS
GETS THERE FIRST

Rates include pick-up and delivery door to door in all principal towns and cities

AIR EXPRESS, A SERVICE OF RAILWAY EXPRESS AGENCY AND THE
SCHEDULED AIRLINES OF THE U.S.

CLUTCH AND SPEED REDUCER

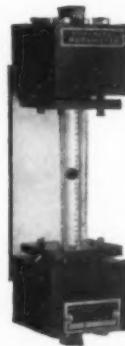


BELT transmission combining a clutch and speed reducer with a 3 to 1 reduction ratio is designed to work on gasoline engines and electric motors used for loads up to 1½ hp with either a ½" or ¾" shaft. Positive, smooth action clutch with no burning or "dragging" of belts is claimed. Unit is adaptable to electric drills, saws, lathes, etc. Either a V-pulley or sprocket may be furnished for the final drive. *Crain-McCurdy Co., 600 Capital Bank Bldg., Des Moines 9, Iowa.*

NON-STICKING ELECTRICAL CONTACT METAL

NEW electrical contact metal, known as Fasaloy 99, is said to have the properties of fine silver plus a substantially higher "no-weld" current value. Laboratory tests are claimed to have shown that the contact surface resistance of the metal is no higher than that of fine silver, even when the contacts are subjected to high temperatures or hydrogen sulphide atmospheres. Fasaloy 99 contacts will make and break resistance load circuits of as high as 25% more current than fine silver, without sticking or welding. Bulletin 7.104 available. *Fansteel Metallurgical Corp., North Chicago, Ill.*

FLOW RATE METER



SHO-RATE rotameter is a flow rate meter for measuring small flows of gases or liquids in purge systems, or in other applications where a reproduceable flow guide is needed to assure efficient operation. Advantages claimed are: a four bolt, flanged packing gland that keeps tight against any pressure up to 500 lbs. per sq. in.; float travel of three inches, giving good visibility; flexibility for quick installation. Optional features include built-in needle control valve; built-in filter, and outlet ball check valve. *Brooks Rotameter Co., P.O. Box B-9448, Lansdale, Pa.*

(Please turn to page 174)

THE GOOD RIGHT HAND OF INDUSTRY



Worthington CN Centrifugal Pump—its short oversize shaft means better service, longer life.

WORTHINGTON



MERCHANDISING DIVISION

The Good Right Hand of Industry

POWER TRANSMISSION: sheaves, V-belts, variable speed drives

PUMPS: centrifugal, power, rotary, steam

COMPRESSORS: horizontal, radial, vertical

It's Versatile . . .

takes whatever

drive is

handiest

Meet the "any-drive" pump—the new Worthington CN many-purpose Centrifugal that can be driven by the most convenient means available.

It's another general utility pump like the famous Monobloc—but without the motor. The liquid end is mounted on a frame, from which the shaft extends to be coupled to a motor, fitted with V-belt sheave, or what have you. In an emergency, you can quickly shift to another type of drive.

More Pumps "Across the Board"

Worthington, world's largest manufacturer of pumps, makes all types, all sizes of standard pumps—steam, power, rotary, centrifugal. The one you select is "job ready"—available from stock—to do your kind of work better and for less money.

Immediate Delivery

Call your Worthington distributor—your local "good right hand of industry"—listed in Thomas' Register at "Pumps". He has ample stocks supported by factory stocks for prompt delivery. And send coupon for free bulletin, showing why, in pumps, *there's more worth in Worthington*.

Worthington Pump and Machinery Corp.
Merchandising Division, Dept. M816
Harrison, New Jersey

Send latest bulletin on Worthington
Centrifugal Pumps. Any other (type)

Name

Company

Address

88-16

BUSINESS IN MOTION

To our Colleagues in American Business...

Manufacturers always check the prices of materials. That is sound procedure. But it is not necessarily true that a material that costs more per pound than another is therefore more expensive. The more costly may prove to be not only better, but actually cheaper.

This was the case with a plate used in certain golf shoes. The plate is located within the sole, and the spikes are screwed into it. Thus they are prevented from digging into the foot instead of the fairway. This is a great idea in golf shoes, and golfers like it. What they do not know is that the plate, once made of cadmium-plated steel, now is made of solid nickel silver, which is inherently rustproof and needs no protective coating.

In making this switch from one metal to another, the shoe company was adhering to its customary policy of making the best shoes it could.

Nickel silver costs more per pound than steel, but that was unimportant compared with the fact that it gave absolute assurance that the plate would be equal in quality with the rest of the shoe materials. However, when the cost figures were in, they were a pleasant surprise. The nickel silver plates cost less than the steel ones, due to elimination of plating and associated operations.

Naturally, before the decision was made to employ nickel silver for this purpose, tests had to be made. Revere collaborated in these. The metal was found to have the required strength and springiness, and of course to be entirely free from rust. It was evident, therefore, that

it would prove itself by long service under the conditions of actual use.

Nickel silver is largely used as the base for silver-plated flatware. It is also bought by jewelry manufacturers, and has both decorative and industrial applications. Key blanks, hardware, electrical and plumbing fixtures, camera parts, slide fasteners are some other conventional applications of this alloy that is both beautiful and durable. So far as we know, this is its first use in such a thing as a shoe plate.

In reporting this new use for an old alloy, and the surprising fact that it proved to be less costly than one that cost less, Revere takes no particular credit. What Revere did in collaboration with the shoe company is no more than any good supplier will do if given the opportunity. The firms from whom you buy materials, whether they be metals or woods, cements or chemicals, felts or vacuum tubes, know a great deal about what they sell you. What they do not know, in all too many cases, is how they can help you to best advantage. All that suppliers need is the opportunity to acquaint themselves with the conditions of fabrication and use. Once equipped with that knowledge, they can set their own brains to work with yours. Thus you will be reassured that you are doing exactly right in specification and fabrication, or, if not, definite and documented suggestions for improvements will result.

Revere suggests, therefore, that you give your suppliers the opportunity to collaborate fully with you.



REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801



Executive Offices:

230 Park Avenue, New York 17, N. Y.

MAGNESIUM BARREL SKIDS



LIGHTWEIGHT all-magnesium barrel skids weigh as little as 25 lbs. in the 7' length and yet have a capacity of 1,000 lbs. Special side beam with rounded surface minimizes friction and damage to barrels. Standard widths of skids permit handling of 22" or larger diameter drums and barrels. *Magnesium Company of America, East Chicago, Ind.*

QUICK-ACTION LIQUID WIRE STRIPPER

STRIPPING of electrical wires is claimed to be speeded by the use of "Formula 21" for removing Formex, Formavar, enamel, and similar wire insulating coatings. Wire is simply dipped in liquid which is wiped off with rag or blown off with compressed air. No scraping, tools or special cleaning is required. Non-corrosive, non-inflammable, and will not harm fabrics, wood or metal. Catalog Section 71 available. *Aircraft Marine Products, Inc., 1575 N. 4th St., Harrisburg, Pa.*

TROUBLE LIGHT REEL

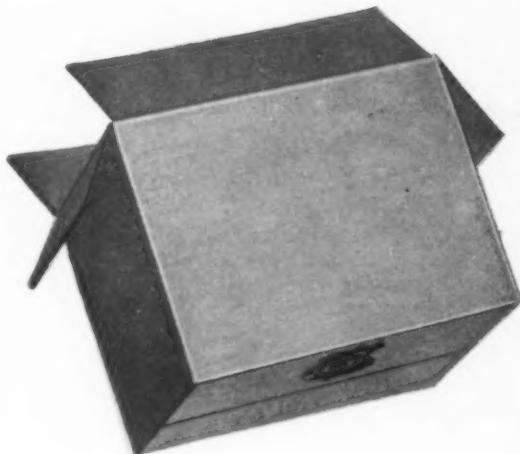


CORDOMATIC "Trouble-Lite" reel can be installed in 10 minutes by anchoring the screw-eye in the ceiling, hanging the reel on it, and plugging the power cord into an outlet. No junction box is necessary. The reel will revolve freely through 360° in the direction of the pull. Used as a wall-mounted reel it will rotate through 180° or may be locked into any of three fixed positions. Available with 20, 25, 40 or 50 foot cord lengths. *Cordomatic Div., Vacuum Cleaner Corp. of America, 1724 W. Indiana Ave., Philadelphia, Pa.*

(Please turn to page 176)

**The proof of value
is the Pedigree**

In boxes, too!



**PROOF OF *Quality*
PROOF OF *Service*
PROOF OF *Fair Price***

A box with a pedigree? Yes, you can trace a Union 100% Kraft corrugated container all the way back to Union's own forests. Every step in manufacture, from tree to finished box, is quality-controlled by *one* responsible management, operators of the largest Kraft pulp-to-container mill in the world.

And more than that: For more than 75 years Union has been the leader in paper packaging, producing specification bags for hundreds of industries.

The same skill in production, the same vast forest resources and mass production economies



THE ENGLISH SETTER, stately in appearance, has been favored as an excellent bird-dog by sportsmen for almost four centuries. He is very gentle and lovable in disposition. He needs plenty of space and exercise in order to be happy, so never confine him to close quarters!

which have put Union at the top in paper packaging have also built a containerboard business which last year accounted for nearly 6% of America's total tonnage of Kraft boxes.

Today Union's board is going into corrugated containers bearing the pedigree mark of the famous Union shield.

This emblem identifies an organization which, for three quarters of a century, has been fully conscious of its responsibilities to customers who must depend on the reliability of their container source for the continued operation of their own plants.

UNION Corrugated Containers

UNION BAG & Paper Corporation

Principal Offices: WOOLWORTH BLDG., NEW YORK 7, N.Y.

Corrugated Container Plants: SAVANNAH, GA. • CHICAGO, ILL. • TRENTON, N.J. • JAMESTOWN, N.C. (Highland Container Co., Inc.)



Your Water Cooler TOP is easy to keep **SANITARY**

because General Electric
water coolers have this:



NO OTHER WATER COOLER HAS ALL THESE G-E FEATURES

HEAVY DUTY CABINET — Stands up under heavy factory floor vibration. Welded heavy gauge steel cabinet of skyscraper design gives years of sturdy service.

STAINLESS STEEL RESERVOIR — Not just an alloy with plated surface subject to corrosion. G-E Water Coolers have corrosion-proof stainless steel reservoirs.

NON-CLOGGING COUNTERFLOW PRE-COOLER — The drain pipe is bonded to the incoming water pipe to give extra cooling efficiency. No traps. No complicated coils.

CONVENIENT, FOOT-PEDAL OPERATION — An easy-to-operate foot pedal eliminates unsanitary hand valves. Workers can drink without laying down packages or tools.

CORROSION-FREE PIPING — General Electric Pressure Bubbler Type Water Coolers use copper piping that's tinned on the inside. This is extremely important to avoid corrosion and bad tasting water.

Ask your General Electric Dealer for information on the full line of G-E Water Coolers. *General Electric Company, Air Conditioning Department, Section W8299, Bloomfield, New Jersey.*

GENERAL ELECTRIC

Water Coolers

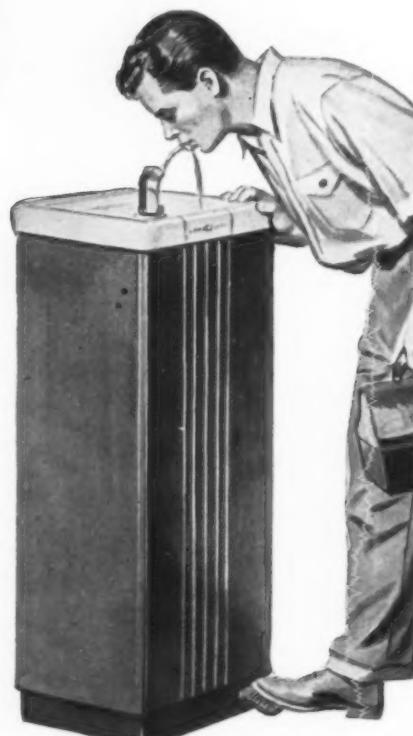
HEAVY DUTY BOX OPENER



ILLUSTRATION shows box opener with patented blade holder that is quickly adjusted to cut varying thicknesses of carton covers. Blade penetrates exactly under the outer cover thickness, protecting contents. Clean cut permits reuse of carton. The opener is made of zinc and is said to protect the user from injury. Literature available. *Flash Box Opener Co., Inc., 52 West Houston St., New York 12, N. Y.*

FLOOR MAINTENANCE MACHINE

THIS floor maintenance machine is available in three sizes, including 13", 15" and 17" brush spread. The "Safety Grip" handle can be controlled with either hand, or both hands. Each handle incorporates a switch which provides positive off-on action when the operator grips it, preventing machine from starting accidentally, and stopping machine if operator loses control. The machine is powered to handle any floor maintenance operation. Wide selection of brushes and attachments available. *American Floor Surfacing Machine Co., 518 S. St. Clair Ave., Toledo, O.*



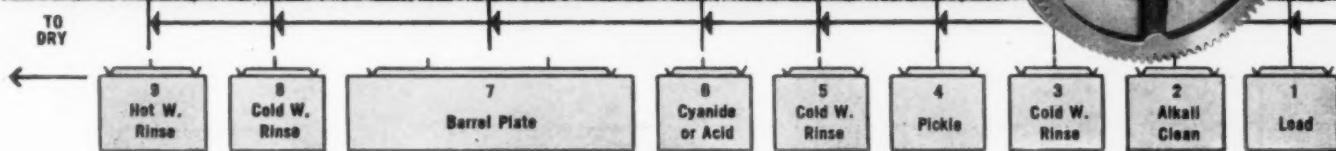
MOBILE BUCKET LOADER



K-5 Bucket Loader is described as built heavily enough for pit and road work yet maneuverable in busy yards. It is equipped with a two strand elevator and four-speed transmission. Separate twin disc clutches control traction and elevator. Elevator has an automatic overload release. Feeder spirals heap material into buckets at speeds up to 2 yards a minute. The machine handles earth, gravel, or broken stone up to 2 1/2" size. It moves under its own power over short distances. Bulletin available. *N. P. Nelson Iron Works, Inc., Dept. 2H, Clifton, N. J.*

(Please turn to page 178)

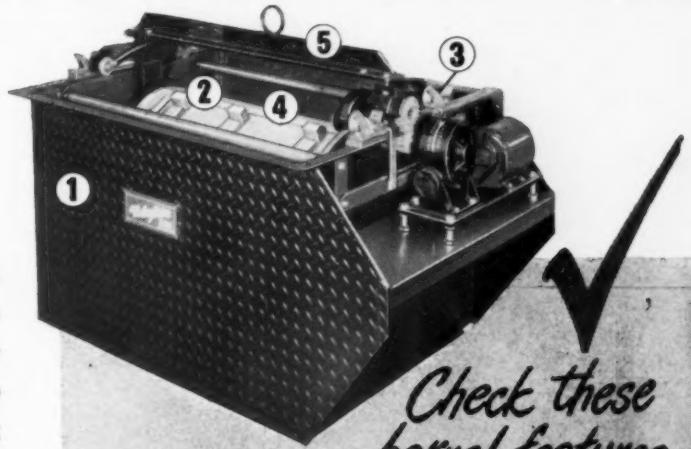
This machine
makes the whole



because
it's Built to TAKE IT!

The "inside story" of Udylite's more efficient barrel-plating is a remarkable new cylinder material able to withstand hot cyanide solutions, hot stannate, and both acids and alkalies. This means you no longer have to transfer work from the cleaning cylinder to the plating cylinder. Your production proceeds more continuously, without time-wasting transfers—especially valuable in processing work which is difficult to transfer, for example, small flat stampings. The work is tumbled in all stations. And you get the important advantages of *electro-cleaning* . . . a real help in removing dirt and grease from deep recesses or from cup-shaped parts.

This advance barrel plater and cylinder is warp-proof, abrasion-resistant, and built to serve for years! Use it for complete one-process cycles, or for other processes simply by cleaning it. Get further details without delay . . . write today!



Check these
barrel features

1. Big, double-welded tank (largest standard barrel tank on the market). Leak-proof construction. Easily accommodates heating or cooling coils.
2. "Deep-Dip" Plating Cylinder. Hangs deeply in the tank to submerge completely inside of barrel, for greater current capacity and faster plating.
3. Heavy contact saddles, of cast brass, machined, for perfect contact with cathode horns. Self-locking device prevents barrel rocking.
4. Rigid rails, reinforced by $\frac{1}{4}$ " steel stay bolts running length of cylinder.
5. Large, steel bridge member holds cylinder in rigid alignment.
6. Steel pinions are hardened and ground for longer life.
7. Cylinder rotates on large, non-freezing bearings.

NAME WHAT YOU NEED . . . UDYLITE HAS IT!

• In addition to the sturdiest, most efficient plating barrels ever built (for both acid and cyanide), Udylite offers a complete line of Fully Automatic and Semi-Automatic Plating Machines, tested laboratory supplies, and complete service, from no-cost testing of your solutions to design of entire plating plants. Call in a Udylite Technical Man on *any* plating problem!

Udylite Corporation, Detroit 11, Michigan

"Pioneer of a Better Way in Plating"



Wide Selection

Blue Devil
SOCKET SCREW PRODUCTS

Socket Cap Screws

Sturdy, cold-formed head—continuous fibre structure.



Flat Head Cap Screws

Flush type screws. Fit standard counter-sink.



Socket Stripper Bolts

Accurately ground shoulder.



Socket Pipe Plugs

Safer, stronger—excellent seal. Made of alloy steel.

Socket Set Screws

Precision-ground thread with rust-resistant finish—five point styles



Socket Screw Keys

Minimum play between key and socket.



SAFETY SOCKET SCREW CO.

4436 N. KNOX AVENUE CHICAGO 30, ILL.

11 Park Place

New York 7, N. Y.

GREASE FITTINGS

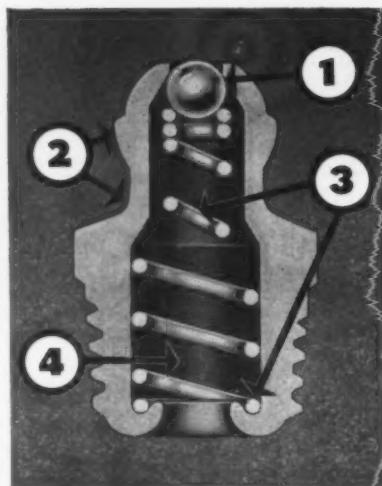


ILLUSTRATION shows features claimed for ball-in-head surface check ballneck type grease fittings: 1—flush ball keeps dirt out, grease in; 2—enlarged neck size and projecting locking pad protect against damage and wear; 3—spring will not compress to restrict flow of heaviest lubricants; 4—larger grease passage permits greater flow of lubricant, requires less pressure to clear the fitting. The fittings can be securely contacted by all commercial hydraulic couplers. Bulletin 209 available, Lincoln Engineering Co., 5701 Natural Bridge Ave., St. Louis 20, Mo.

STACKRACK ADAPTORS



ADAPTORS to accommodate Stackbin-Stackrack combinations permit smaller sizes of Stackbin combinations to be combined with the larger ones, making a storage rack of various sizes. The adaptors lock the Stackracks together, without the use of tools, to form storage racks of any capacity. Stackbins have the open hopper front, and can be used at tote pans, storage or assembly bins. They slide into the racks like drawers. Stackbin Corp., Pawtucket, R. I.

Another DOLGE First!

KADOL

The New LIQUID
Floor Cleaning Compound
DEVELOPED IN DOLGE LABORATORIES

KADOL is today's method of cleaning various types of flooring because its concentrated, brilliant liquid form permits pouring to make an economical dilution of only two ounces to the gallon of water. Easy to handle—and it goes a long, clean way in keeping your floors immaculate.

KADOL is neutral—can be used safely on linoleum, cork, also wood mastic, tile and many other surfaces, and is recommended as a general cleaner. No rinsing is ordinarily required; when a KADOL-cleaned surface is dry-mopped, an attractive polish results.

KADOL has no druggy, clinging odor associated with usual cleaning compounds. Its fragrance is pleasant and unobtrusive.

Write for the new KADOL booklet which explains its many advantages, and see your DOLGE Service Man.

KADOL

The C. B. DOLGE CO.

WESTPORT, CONNECTICUT

MR. P. A.

It's smart to order
what they want . . .

**SPECIFY
SKIL Drills!**

*Men who
know
say . . .*



"USE SKIL Drills"

Ask about SKIL Drills anywhere in

industry! The answers you get will all add up to this:

Don't just drill it . . . SKIL Drill it!

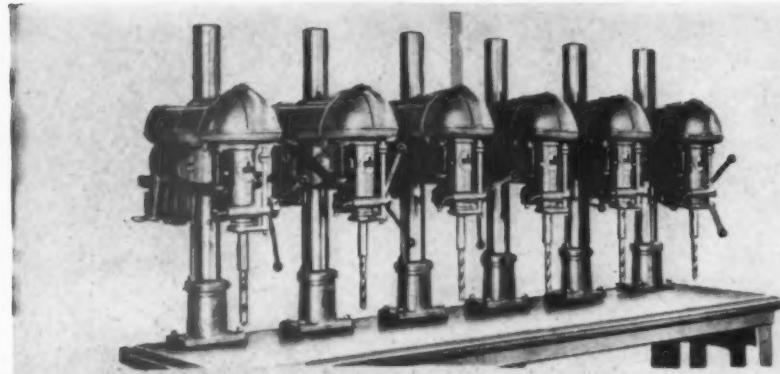
Ask workers, and you'll hear about better balance,
easier handling, faster production. Ask engineers, and you'll hear
about extra power, less weight, better design and construction.

Ask purchasing departments, and you'll hear about longer service,
finer features and lower costs.

Then grab that phone and ask your SKIL Tool Distributor to
demonstrate SKIL Drills today. 26 Powerful models.

SKILSAW, INC.
5033 Biston Ave., Chicago 30, Ill.
Factory Branches in Principal Cities
In Canada: SKILTOOLS, LTD.,
66 Portland St., Toronto, Ont.

SKIL ELECTRIC
Tools PNEUMATIC
TRADE-MARK

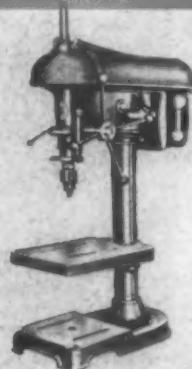


Multi-Spindle 20" Drill Presses—Capacity: steel, $\frac{3}{4}$ "; cast iron, 1". One to six spindles of 6"

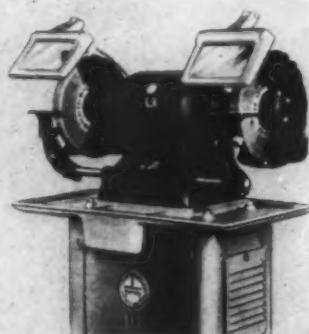
travel. Spindle nose to table 25". Hand or power feed. Five spindle speeds.



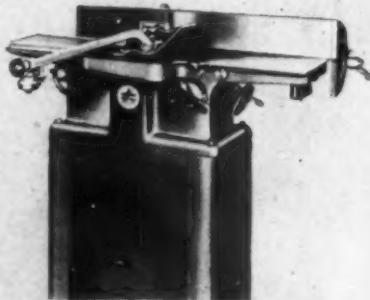
20" Floor Model Drill Presses—Capacity: steel, $\frac{3}{4}$ "; cast iron, 1". 6" spindle travel, hand or power feed. Five speeds.



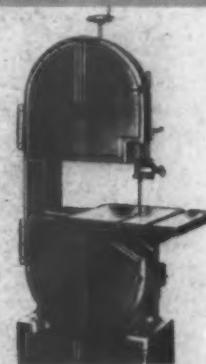
15" Drill Presses— $\frac{1}{2}$ " capacity Jacobs Chuck, $4\frac{1}{4}$ " spindle travel; four speeds, 600 to 5000 R.P.M. with 1740 R.P.M. motor.



Grinders—Ball bearing models in 10", 7" and 6" wheels. Ample clearance, guarding and dust protection.



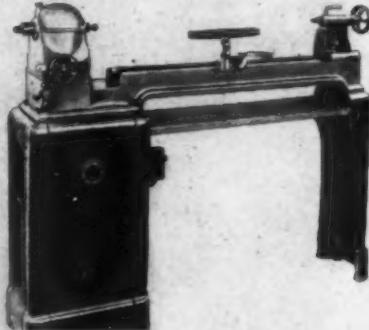
6" Jointer—Planes accurately; rabbets $\frac{1}{2}$ " deep. Cuts ribbon thin, handles narrow strips safely. Quick set-up and locking.



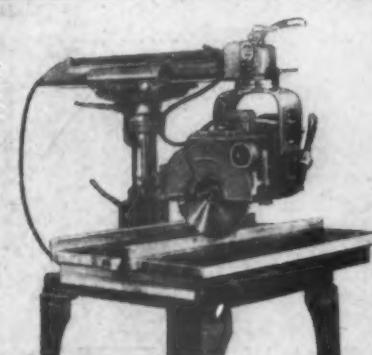
14" and 16" Band Saws—61 to 5300 S.F.P.M. according to model. Table tilts 45°. Dynamically balanced wheels.



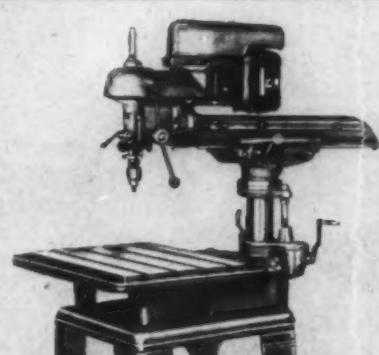
10" Tilting Arbor Saw—Depth of cut, $3\frac{1}{8}$ ". Blade-arbor tilts to 45°. Self-indexing miter gauge. 1 H.P., 1 phase; $1\frac{1}{2}$ H.P., 3 phase.



Lathes—wood or plastic; soft metal spinning; gap swing 15", 12" over bed; 38" between centers. Speed ranges 290-3750 R.P.M.



Radial Saws—for wood, plastic; cut $4\frac{1}{4}$ " deep with 12" blade. $21\frac{1}{2}$ " ram travel, rips 38" wide, cuts any angle. 1, $1\frac{1}{2}$, 2 or 3 H.P.



Radial Drill—reaches 62" for wide bulky work. Head tilts 45°, $4\frac{1}{4}$ " spindle travel, $\frac{1}{2}$ " Jacobs Chuck. Sixteen spindle speeds.



Radial Metal Cut-Off Machines— $4\frac{1}{4}$ " clearance depth with 12" wheel, cutting arc up to 1"; $21\frac{1}{2}$ " ram travel. 1, $1\frac{1}{2}$, 2 or 3 H.P.

Die and
pattern shops



Machine
shops



Maintenance
departments



Box and crate
departments



SPECIFIED BY INDUSTRY

WALKER-TURNER LIGHT MACHINE TOOLS

Service and
repair shops



**LIGHT
MACHINE
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In almost every manufacturing plant — in practically every industry where metal, wood or plastic is drilled, cut or shaped, Walker-Turner Light Machine Tools are on the job. Adaptable to the most unusual or difficult problems in die, pattern and machine shops, in box and crate, service, repair, maintenance and other areas, Walker-Turner will meet the most exacting requirements — give years of service. Specify Walker-Turner Light Machine Tools right down the line in your plant. *For complete catalog, write to Kearney & Trecker Corporation, Walker-Turner Division, Plainfield, New Jersey.*

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 46 South Street • New York

ELECTRICAL EQUIPMENT FAILURES CAN BE REDUCED

Every day in many cities and towns in these United States production is halted in some mill or factory because of a failure of electrical equipment.

In the majority of instances, according to the Owens-Corning Fiberglas Corporation such failures are due to insulation breakdown caused by overloads or other unavoidable conditions. But because it is impossible or impractical to alter the conditions under which the equipment operates, it is not necessary to assume that insulation breakdown and consequent equipment failure must be accepted as part of the production routine.

Class A (organic) insulation, with which the equipment may be originally wound, tends to disintegrate under excessive heat, moisture, corrosive chemicals and fumes. By rewinding the equipment with Class B (inorganic) insulation it is frequently possible to reduce greatly, or even eliminate, equipment failure due to breakdown of the insulation.



Winding transformer coil with Fiberglas insulated rectangular magnet wire

The development of glass in fiber form — Fiberglas—is responsible for the present wide use of glass as a Class B insulation material, for prior to this development it was not possible to use glass in the many applications where a pliable form of insulation is required. Heavy-duty motors and other large units provide dramatic illustrations of the performance of Fiberglas insulation under adverse conditions, but its usefulness is by no means confined to such units.

A rayon manufacturer, for instance, is in the process of rewinding thousands of spinner bucket motors in six plants with Fiberglas insulation. The motors are being rewound to enable them to operate under acid, moisture and overload conditions that caused the motors, when wound with Class A insulation, to burn out at the rate of 1700 motors per week.

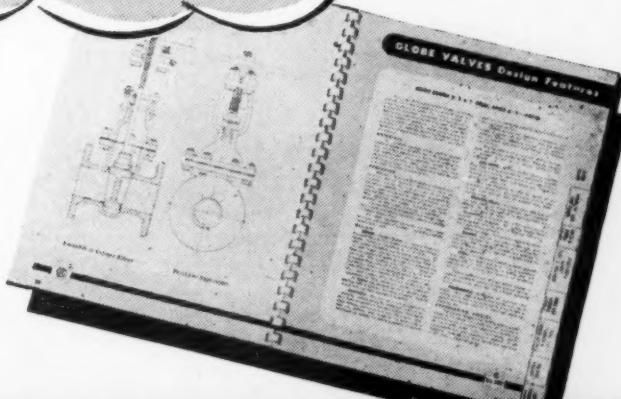
A 1½-hp totally enclosed motor is employed to operate a vertically mounted sump pump for returning condensate to the boiler of the heating system of a Cleveland machine shop. The motor, used only in winter, is enveloped by steam and

(Please turn to page 184)

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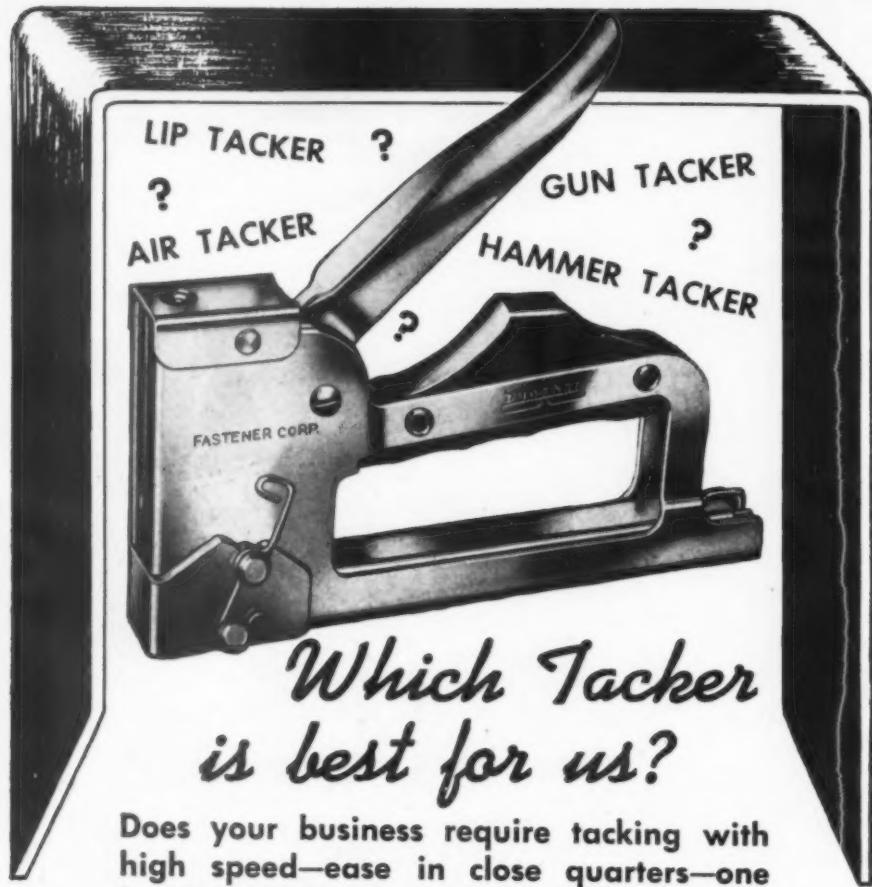
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**HAMMER GUN AND AIR
TACKERS AND STAPLES**
FOR REDUCED PRODUCTION COSTS

DUO FAST

(Continued from page 182)
occasionally immersed in scalding water. Because of these conditions, the Class A insulation failed at least once each heating season, and sometimes twice.

It took a minimum of two days to have the motor repaired and put back in service. During these periods, cold water had to be hand-fed into the boiler—a practice that reduced heating efficiency, increased fuel costs and was an all-around nuisance. In 1942 the motor was given a Fiberglas rewind. Since that time the motor has not failed.

Insulation of an induction heater employed by an Ohio plastics manufacturer is subjected to temperatures of 350 to 450 degrees, F., and, from time to time, to contact with molten resin which may surge out of a broken die over the winding. No insulation can stand up under such operating condition over a long period, but the Fiberglas insulation with which the heater has been rewound has marked up a much better performance record than the original Class A insulation. In addition, the heater can be rewound more quickly and easily with the Fiberglas insulation than with Class A insulation.

At a plant in western Pennsylvania, 150 10-hp, semi-enclosed blower motors are employed to drive off gases and cool melt furnaces. Although these motors are placed on the top edges of open furnaces operating at 1800 degrees, F., they are protected only by a base plate.

The furnaces are gas-fired. In starting them, gas occasionally escapes from the feed line before it is ignited, causing an explosion in the furnaces. When this happens, the grease is burned off the housings of the blower motors. Since the building in which the operation is housed is of shed-type construction, with open eaves at the top, the motors are subjected to moisture during snow and rain storms.

Class A-insulated motors failed on an average of every three months. Thirty of the motors have now been rewound with Fiberglas insulation. The remainder are being rewound with Fiberglas insulation as fast as they fail. The first motor to be rewound with Fiberglas insulation has operated 22 months without failure, and during this period has been subjected to two gas explosions.

In a St. Louis foundry, the ladle crane is the heart of the operation. Dependability of the crane means the difference between profit and loss. A five-minute delay in having the crane on the job can result in the loss of a heat, with all that entails in loss of labor and materials.

The crane's motors must operate under high temperatures, due both to convection and radiation from the source. These motors were long ago rewound with Fiberglas insulation. In spite of severe operating conditions, the foundry has not lost, because of an electrical failure, a single heat during the past five years.

Repair shops are familiar with Fiberglas electrical insulation materials, and are equipped to install them when specified. Many repair shops have built up an enviable volume of business by specializing in Fiberglas rewinds. The owners of a

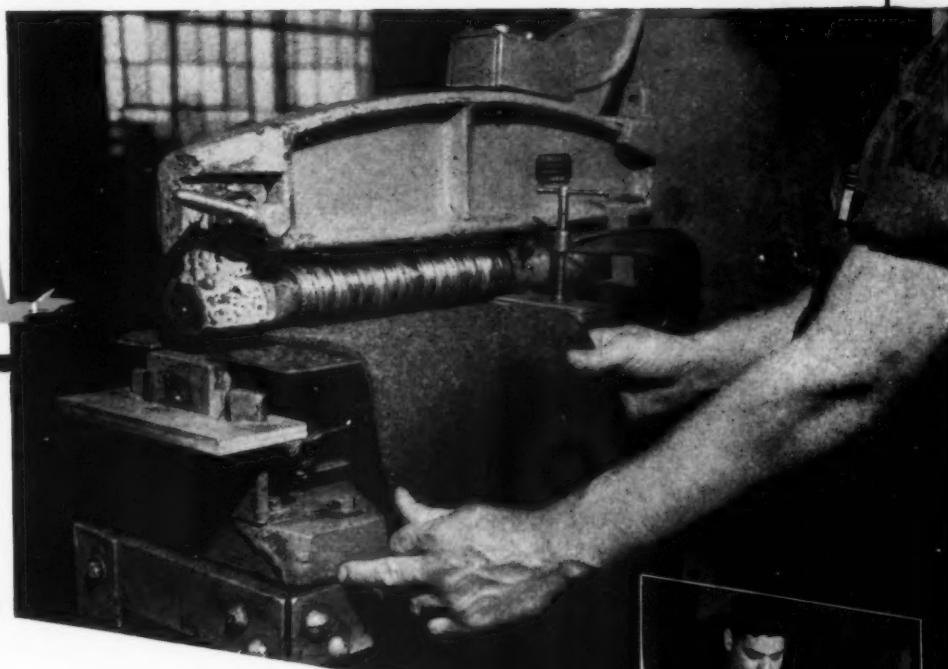
(Please turn to page 188)

**A case
history
from the
note book
of a
Disstioneer**



How a Disstioneer helped boost production 50%

*Feeding felt into machine equipped with a
14-blade gang of Disston Circular Knives*



He may be able to do as much for you

Helping to increase production and cut costs is an important part of the service offered by Disstioneers. Daily, these cutting tool specialists are invited by manufacturers like you to study operations and to show how and where improvements can be made. Here is a typical instance:

The American Felt Company, Detroit, was cutting $\frac{1}{4}$ " to 1" wide and $\frac{1}{4}$ " thick strips of felt from rolls 400 to 500 feet long. The method used was slow, for it permitted the cutting of but one strip at a time. Widths were inaccurate. Knife sharpening was frequent and down time very costly.

A Disstioneer showed how several strips could be cut in a single operation. The recommendation was adopted. Now the company is cutting up to 25 strips at a time, and has several gangs set up to cut various widths. Disston Knives stood up far longer; sharpening was reduced to but once in 7 days; down time was cut almost to zero; the felt strips are clean-cut and accurate . . . and production has been increased approximately 50% with a considerable reduction in knife costs.

A Disstioneer will be glad to make a study of your cutting operations and submit his recommendations . . . without charge or obligation.

Write for full particulars, or get in touch with your local Disston Distributor.

*Felt strips come out clean-cut and
of uniform size.*

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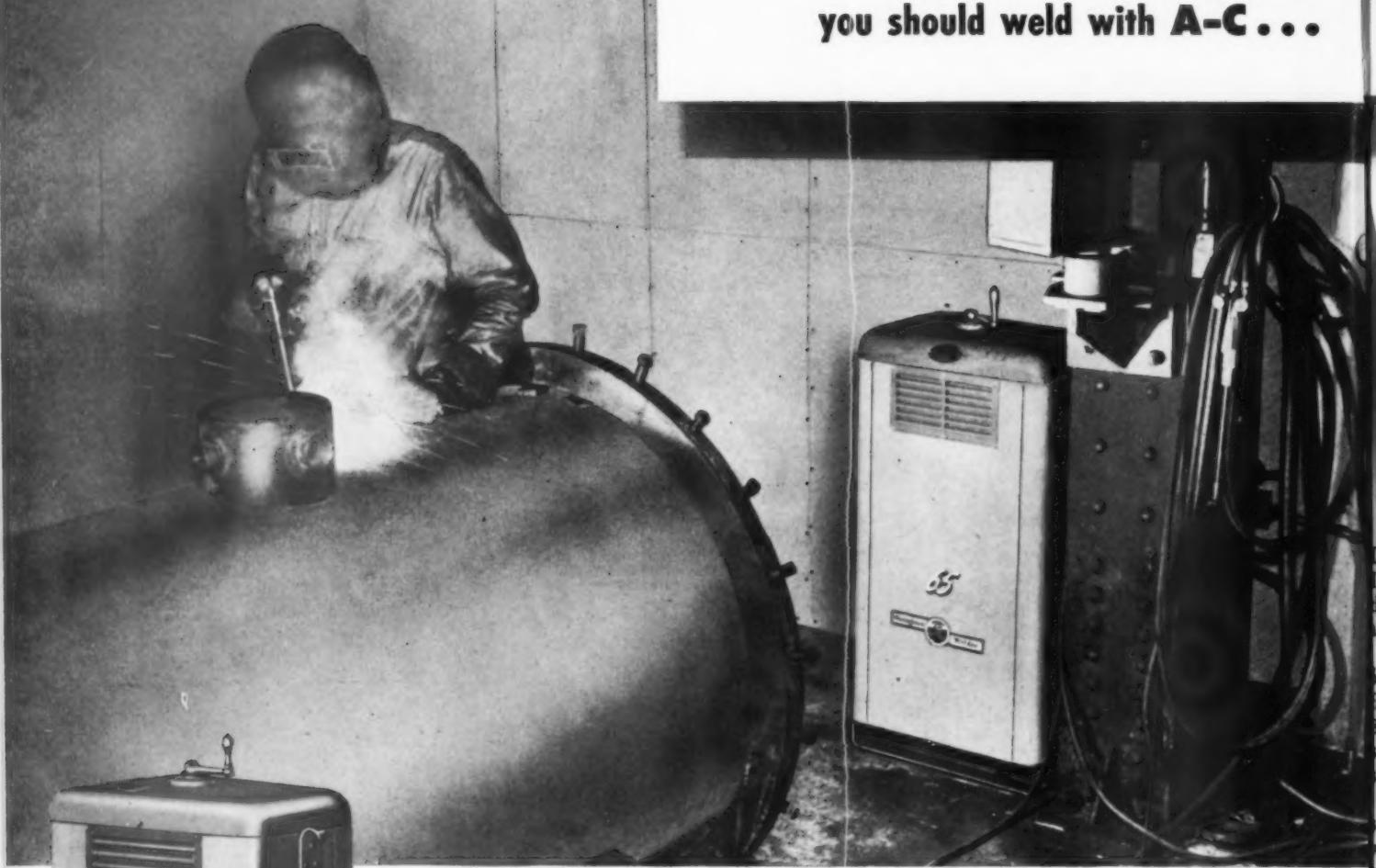
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STEEL
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Here's a dollars and cents example of what you should weld with A-C...



FLEXARC ELECTRODES AND FLEXARC WELDERS . . . THE IDEAL OPERATING TEAM

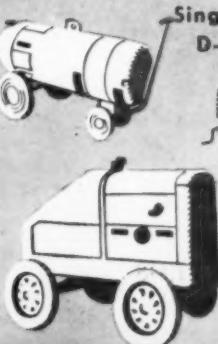
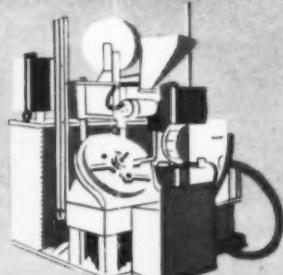
Westinghouse Flexarc Electrodes work especially well with the new power-saving, low-voltage Flexarc "65" Industrial A-C Welders. Typical of the increasing use of this cost-saving team is this application at Worthington Pump Company, Harrison, N. J.

The Flexarc "65" provides the most advanced design of industrial a-c welders—built to operate with an open-circuit secondary voltage of only 65 volts. It overcomes the problems of arc instability which formerly limited the use of lower voltages for heavy-duty industrial welding.

Available in 200, 300, 400, 500 and 600-ampere ratings. Ask for complete information on these and other Westinghouse A-C Welders up to 2,000 amperes in size.



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Manual Type A-C Welders
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1000 Amp
A-C Welder

Automatic
Welding Equipment

Single Operator
D-C Welders

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D-C Welder

MODERN A-C WELDING WILL BRING YOU SAVINGS

... EQUAL TO THE COST OF
YOUR ELECTRODES!

Do you know how much your electrodes cost you? It's a tidy sum. If you are now welding with d-c, you can save the equivalent of that cost . . . or more . . . simply by using modern, more efficient a-c welding techniques and equipment.

Actual operating figures prove that a-c welding is *faster . . . better . . . cheaper*. They show a-c welding to be 20% to 30% faster, providing savings in labor . . . that electrical efficiency is 35% to 90% for a-c compared to 55% to 65% for d-c, providing savings in power . . . that depreciation and maintenance costs are substantially reduced.

A Westinghouse welding specialist is ready to show you the savings you can make. Call your near-by Westinghouse office, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna.

WESTINGHOUSE FLEXARC ELECTRODES . . . FIRST FOR A-C WELDING

For a-c welding of any type . . . for high-quality welds at high-production speeds . . . you can be sure of results with Flexarc Electrodes. They were the first to make a-c welding practical, opening the way to today's increasing acceptance of this faster, better, cheaper method.

Each Flexarc Electrode has definite characteristics for specific welding requirements . . . developed and perfected by Westinghouse for easy arc control, easy metal deposition and sound, attractive finished welds. Immediate delivery . . . in any quantity . . . on most types.

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A FLEXARC ELECTRODE FOR EVERY NEED...

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and

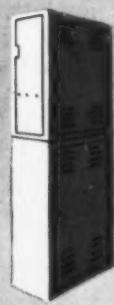
the New Flexarc Electrode which eliminates "underbead cracking"

EVERYTHING for Welding ANYTHING!

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Brazing Alloys
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"65" A-C Welder—also on items checked.

- Automatic Welding Equipment
- Engine-driven Welders
- HF Stabilizers
- Brazers
- Electrodes
- Resistance Welding Control
- D-C Welders

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Engineer: Look at the artistic revision job Miss Jones is doing.

Draftsman: Nice mat surface, too! That reminds me that we should make all our drawings on Arkwright Tracing Cloth. It stands revisions so much better than perishable tracing paper.

Revision means little to Arkwright Tracing Cloth. It stands up without wearing through and re-inks without feathering. Its translucency is built in from surface to surface. For only a thrifty trifle more in cost, it will pay you to make all your drawings on Arkwright. Then you can count on perfect reproduction after repeated handling or years of aging in the file.

See for yourself how much better Arkwright serves. Sold by leading drawing material dealers everywhere. Generous working samples on request. Arkwright Finishing Company, Providence, R. I.

The Big Six Reasons Why Arkwright Tracing Cloths Excel

1. Erasures re-ink without feathering.
2. Prints are always sharp and clean.
3. Tracings never discolor or go brittle.
4. No surface oils, soaps or waxes to dry out.
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AMERICA'S STANDARD FOR OVER 25 YEARS

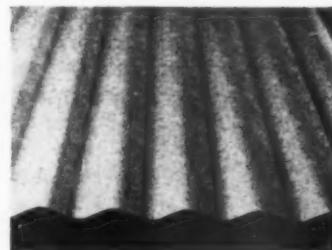
(Continued from page 184)

Tulsa, Oklahoma, repair shop, for instance, have been able to convince a pipe line customer that the original higher cost of a Fiberglas rewind, as compared with a Class A rewind, is more than offset by the savings that result.

Due to overload and other severe operating conditions, 500-hp motors employed to power oil pumps operated less than a year without insulation failure when wound with Class A insulation. More than three years ago the motors were rewound with Fiberglas insulation. Since then there has been no downtime for rewinds.

NEW CORRUGATED ALUMINUM ROOFING AND SIDING

New type of corrugated aluminum sheet roofing, siding and similar structural uses is announced by the Reynolds Metals Co., Louisville, Ky. In addition to the standard lengthwise corrugation, it features an embossed finish which increases the rigidity of the sheet and minimizes glare.



Embossed finish minimizes glare

Known as Embossed Corrugated Roofing and Siding, the material can be supplied in 0.019 and 0.024-inch thicknesses and in a standard width of 26 inches; lengths vary from 6 to 12 feet. It is produced in standard 1 1/4 and 2 1/2 inch corrugations (and also as 5-V crimp roofing and siding). Methods of application are the same as those for applying other corrugated roofing and siding.

A square (100 sq. ft.) of the .019 sheet weighs about 30 pounds, while the .0240 inch thickness weighs approximately 35 lbs. per square.

FREE BOOKLET ON DENSIFIED WOOD

New booklet of 16 pages, profusely illustrated, just released by the Bakelite Corporation, 300 Madison Avenue, New York, N. Y., describes the many uses of densified wood, and how it has become an effective new engineering material for industry.

Harder than any solid wood and lighter than any solid metal, densified wood, or compreg, is a laminated material made from an assembly of resin impregnated veneers that are highly compressed at the time of setting the resin. Depending upon the pressure used, the assembly will decrease during compression to approximately 50% of its original thickness.

The booklet, entitled "Densified Wood Made with Bakelite Resins" portrays how (Please turn to page 190)

SIX SOLUTIONS TO YOUR D-C POWER PROBLEMS



Federal Selenium Rectifier Equipments



HERE'S FEDERAL'S line of standard D-C Power Supplies which offer you a convenient, economical and always *dependable* source of direct current for a wide range of industrial and laboratory applications.

These attractively styled, compact and efficient units are completely self contained—ready to connect to your a-c power supply—ready to supply d-c power wherever and whenever you want it. Because they are powered by Federal's long-life Selenium Rectifiers, their service life is practically unlimited—with no expendable parts which require frequent replacement. These equipments are conservatively rated, using the new heavy-duty stacks which assure a wide margin of safety to withstand momentary heavy overloads.

For complete information on these new d-c power supplies, write to Federal today—Dept. E 334.

Available for IMMEDIATE DELIVERY

- 1 **FTR 3300-DS** D-C Output—2-32 volts, 50 amperes
A-C Input—115 volts, 1-phase, 60 cycles
- 2 **FTR 3339-BS** D-C Output—6-24 volts, 18 amperes
A-C Input—115/230 volts, 1-phase, 50/60 cycles
- 3 **FTR 3128-BS** D-C Output—22-30 volts, 10 amperes (filtered and regulated)
A-C Input—115 volts, 1-phase, 60 cycles
- 4 **FTR 3341-AS** D-C Output—28 volts, 5 amperes
A-C Input—115 volts, 1-phase, 50/60 cycles
- 5 **FTR 3246-BS** D-C Output—6 volts, 10 amperes (filtered)
A-C Input—115 volts, 1-phase, 60 cycles
- 6 **FTR 1342-AS** D-C Output—6 volts, 4 amperes (3 cells 6-3 amperes)
A-C Input—115 volts, 1-phase, 50/60 cycles

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KEEPING FEDERAL YEARS AHEAD... is IT&T's world-wide research and engineering organization, of which the Federal Telecommunication Laboratories, Nutley, N. J., is a unit.

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PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

In Business for Your Safety

(Continued from page 188)
densified wood is being used in varied civilian products such as cutlery, household accessories, and sporting goods, and how it is being applied by industry for such uses as molds and dies, extrusion turntables, textile picker sticks, spool ends and shuttles.

111

DEVELOP PAPER SLEEVE VALVE FOR BURLAP BAG

The development of a paper sleeve valve in rip-cord closed burlap bags, is announced by Bemis Bro. Bag. Co., St. Louis 2, Mo. The valve burlap bags may be used on the same filling machine as valve paper bags, eliminating the need for two types of filling and closing equipment. The valve makes for economy and convenience in the packing operation, and increases the re-use value of the bags.



Bemis rip-cord closed burlap bag with paper sleeve valve.

The paper sleeve is made of smooth Kraft paper and is bonded to the burlap with thermoplastic. The paper insert is placed in the mouth of the turned bag and passed through a special heat sealing machine where heat and pressure fasten it securely to the fabric.

111

NEW A. S. A. ABRASIVE WHEELS SAFETY CODE

Changes to bring the American Standard Safety Code for the Use, Care, and Protection of Abrasive Wheels (B7.1-1947) into line with current practice have been made in a new edition which was approved recently by the American Standards Association. Copies are now available.

The new 1947 edition is a revision of the 1943 edition. It was prepared by a nationally representative sectional committee under the procedure of the American Standards Association. Because of an increase in the use of small mounted wheels and points, two new tables have been added to the standard to cover critical speeds for wheels and points using 3/32-inch spindles. Slightly higher speeds for Types 12 (Dish Wheels) and 13 (Saucer Wheels) are now permitted. Diamond wheels have been subdivided into different groups with different speeds allowed for each. These new speeds are provided because of changes in the manufacture and use of diamond wheels which have taken place since 1943.

Copies of the standard may be obtained from the American Standards Association, 70 East 45th Street, New York 17, N. Y., at 75 cents per copy.

(Please turn to page 132)

What type of STAINLESS FASTENER do you need?



Prompt delivery from the largest stock in the nation!

Screws . . . nuts . . . washers . . . pins . . . Allmetal carries the largest stock in the country of stainless steel fasteners and screw machine parts. We also have facilities for heading, tapping, drilling, reaming, slotting, turning, stamping, broaching and centerless grinding . . . and we work not only with stainless and monel, but also with duralumin, aluminum, brass, bronze, or any other non-corrosive metal. All parts produced to close tolerances. Write for our catalog today. Allmetal Screw Products Co., Inc., 33 Greene St., New York 13.

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This new, 83-page catalog helps you select the correct size and type of non-corrosive fastening device for any particular job. Includes stock sizes, specials that can be made, engineering data, etc. Make request on company letterhead.

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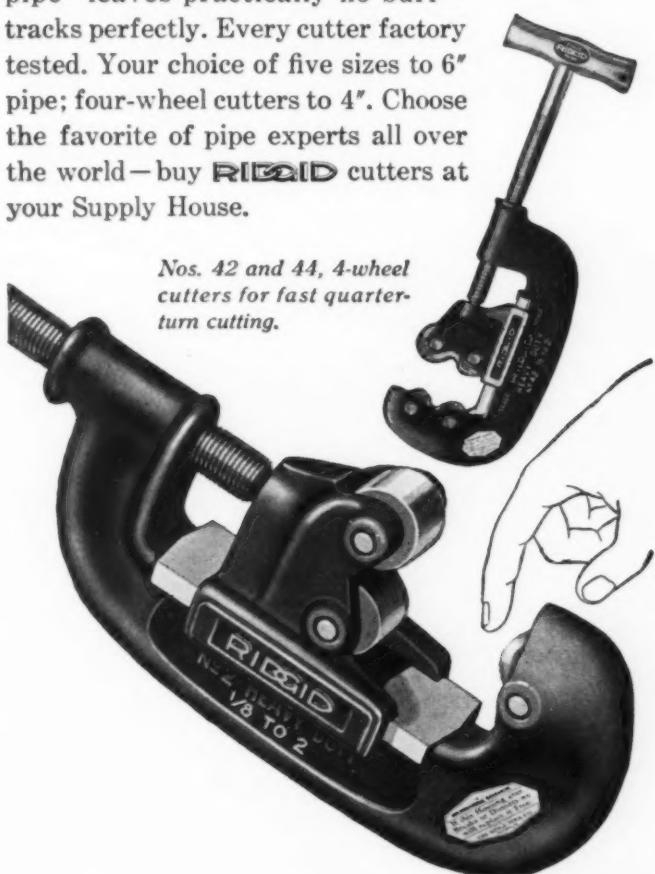
**SPECIALISTS in
STAINLESS FASTENERS**

**MORE QUICK CLEAN
Pipe Cuts
FOR YOUR MONEY**

RIDGID Cutter with thin blade
wheel rolls easily through all kinds of pipe

• It's a cinch to cut pipe extra fast with the new efficiency-balanced **RIDGID** cutter. Extra cutting power comes from the heat-treated tool-steel blade; tough and thin, it rolls easily through any kind of pipe—leaves practically no burr—tracks perfectly. Every cutter factory tested. Your choice of five sizes to 6" pipe; four-wheel cutters to 4". Choose the favorite of pipe experts all over the world—buy **RIDGID** cutters at your Supply House.

*Nos. 42 and 44, 4-wheel
cutters for fast quarter-
turn cutting.*



**EXTRA EASY
Threading
OF SMALL PIPE**

RIDGID 00R Ratchet Threaders
give quick, clean threads on $\frac{1}{8}$ " to 2" pipe

• No bothersome get-ready with these handy little **RIDGID** Threaders. Just snap in size die head you need and go to work. Even on close-to-wall threads there's no fuss or trouble—no extra dies required. These **RIDGID** Threaders make it easy to get clean, quick threads on all kinds of small pipe. Sturdy steel and malleable construction—long life heat-treated tool-steel dies. No. 00R $\frac{1}{8}$ " to 1" pipe; No. 111R, $\frac{1}{8}$ " to $1\frac{1}{4}$ "; No. 12R $\frac{1}{8}$ " to 2". Buy them at your Supply House.



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**WORK-SAVER
PIPE TOOLS**

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HAYDON
RESET TIMERS



These adjustable time delay units are available in 4 models, depending on the time delay period required, most of which are available for immediate delivery. Each incorporates a sturdy mounting frame, stainless steel return spring, adjustable stop arm, graduated dial, and adjusting knob. All models use the same graduated dial, with the values for each shown below the adjusting knob.

Model No.	Time Delay Range	Value of Dial Graduations
5901-1	0-15 seconds	1.5 seconds
5901-2	0-1 minute	0.1 minute
5901-3	0-10 minutes	1.0 minute
5901-4	0-5 minutes	0.5 minute

VOLTAGE: 110, 220 volts

FREQUENCY: 50, 60 cps.

(When ordering, specify unit number, voltage and frequency.)

Frequent adjustment is not recommended. Switches are single pole, double throw Micro-Switches, rated to carry 10 amperes at 125 volts ac, and may be used on either normally open or normally closed circuits.

Haydon timing engineers are prepared to assist you with your special requirements, demonstrate the versatility and dependability of Haydon timers in operation at your desk. Write for Engineering Data Catalog or expert field service. For immediate reference, see Haydon Catalog in Sweet's File for Product Designers.

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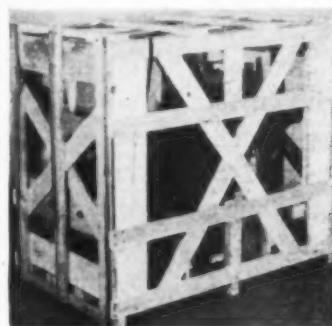
SUBSIDIARY OF GENERAL TIME INSTRUMENTS CORPORATION

GRINDING WITH OIL

A completely revised edition of the booklet "Grinding With Oil", a 20-page catalog and handbook of grinding information, has been published by the D. A. Stuart Oil Co., Ltd., 2727 S. Troy St., Chicago, Ill. Revamped to keep the metalworking industries abreast of rapid changes in grinding with oil, the booklet contains a good deal of data on the application of Stuart oils to precision grinding. There are also sections on selecting proper oils and grinding wheels, wheel marking systems, and a chart of standard wheel shapes. Copies are available for the asking.

1 1 1
**ENTIRE ENGINE SHIPPED
IN ONE PACKAGE**

Weighing in at 750 lbs., this complete truck engine is being shipped complete in a stitched panel crate designed by packaging engineers of the General Box Co., 500 North Dearborn St., Chicago, Ill. The



The truck engine in this stitched panel crate weighs 750 pounds.

engine is held rigidly in place by interior blocking and by bolting the engine to the end of the crate. The base of the crate is so constructed that a one-inch clearance is provided for materials handling equipment to move the engine without the aid of pallets or manpower.

1 1 1
**GLASS REINFORCED RUBBER
BELTING AND HOSE**

Development of a hot materials conveyor belt that is cushioned with rubber and strengthened with glass, and a glass-fiber rubber hose that resists any kind of acid, is announced by the Hewitt Rubber Division, Hewitt-Robins, Inc., Buffalo, N.Y.

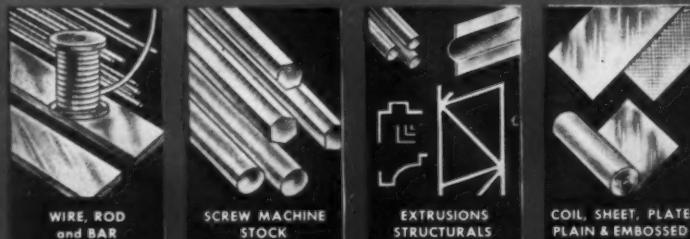
Fiberglas fabric is used in producing the belting, and Fiberglas yarn is the reinforcing material in the hose. The hose is said to perform with maximum resistance to high temperatures, to have prolonged maintenance of maximum high tension resistance, and to provide increased flexibility under high temperature service conditions and resistance to hardening and stiffening.

In the use of the hot materials conveyor belting, Hewitt has found it will not char or lose strength from heat under 350 deg. F., nor will it lose strength at the fasteners by heat burning out around bolts. It will not stretch for there is very little elongation in fiberglas fabric, and the plies are said to be as strong as steel of equal weight.

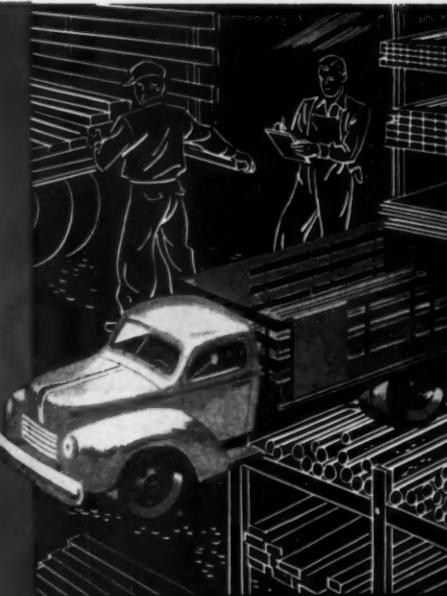
(Please turn to page 194)



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Materials
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NEW SYNTHETIC MAY SURPASS NATURAL RUBBER IN TIRE TREADS

A new synthetic rubber which may equal or surpass natural rubber in tire treads was described recently at a symposium on "The National Rubber Situation," sponsored by the Chemical Engineer's Club of Washington.

In making the announcement, John P. Coe, vice president and general manager of the United States Rubber Company's synthetic rubber division, said two large plants are now being equipped to produce the superior new rubber, which results from research conducted by the synthetic rubber industry under sponsorship of Office of Rubber Reserve.

One plant is that operated by U. S. Rubber at Borger, Texas. The other is operated by Copolymer Corporation in Baton Rouge, La.

"Preliminary data have indicated tire tread quality substantially improved over anything achieved heretofore with natural rubber," Mr. Coe said. He added that even the most conservative chemical engineers rate the new rubber as 'at least equal to natural, according to preliminary data.'

"If this improvement is established by service performance of tires over this year and next, it is expected that such rubber will be used almost regardless of price," Mr. Coe continued.

"Since tire tread rubber amounts to perhaps 30 per cent of the natural rubber consumed, this use would definitely put GR-S synthetic rubber on an independent basis."

Secret of this improvement in man-made rubber, Mr. Coe indicated, is a sharp reduction in temperature of the chemical reaction by which the GR-S is produced from butadiene and styrene. The new rubber is made at the frigid temperatures between zero and 40 degrees Fahrenheit, instead of at the customary 125 degrees.

"It is my position," Mr. Coe said, "that synthetic rubber has now proved itself technologically, that it will continue to be manufactured and used on its own merits as a new material required by industry."

1 1 1

NEW SYSTEM FOR PRICING EXTRUDED ALUMINUM SHAPES

A new system for pricing aluminum extruded shapes in which the price bears a more correct relation to actual costs because it gives recognition to the effect of complexity and other factors in producing various shapes, is announced by the Reynolds Metals Company, 2500 So. Third Street, Louisville, Ky. The cost of an average extrusion, the company states, is roughly one-third metal, two-thirds processing. For a given alloy a press can extrude many more pounds of a simple heavy section than is possible with a complicated thin section, and there are other cost factors in heat treating, straightening, etc., that must be taken into consideration. For instance, it is more work to handle a length of thin section than the same

(Please turn to page 196)



where

copper's
face value counts

and

steel's
strength and
economy are needed . . .



Gain both

with

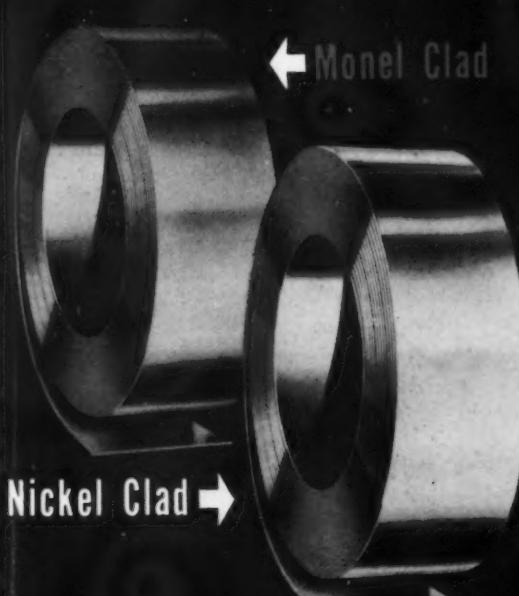
SuVeneer
COPPER CLAD METAL

* Trademark Reg. U. S. Pat. Off.

SuVeneer Copper Clad Metal gives you a *double* fabricating advantage: the surface characteristics of solid copper—clad to one or both sides of low carbon, deep drawing strip steel. With this composite metal you can draw, spin, stamp or shape your products as you please . . . the bond cannot separate. And for production economies and handling ease, SuVeneer is furnished in coils or cut lengths, to specified widths, thicknesses and tempers. • *Write for the idea-sparking SuVeneer Clad Metal folder!*

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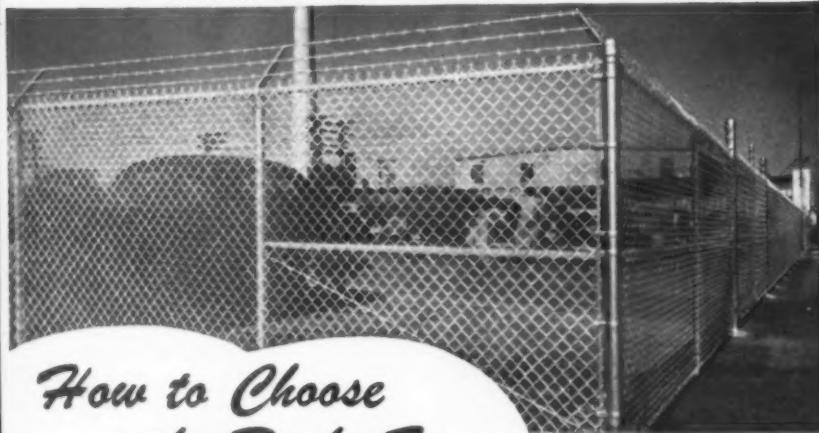


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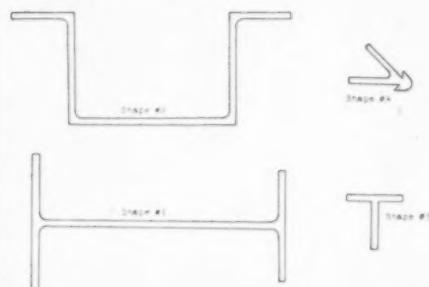
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(Continued from page 194)

length of a thick one. Under the system adopted by Reynolds, a formula is employed which allows the price to bear a more correct relation to actual costs. At present the new formula and prices cover solid extrusions only.



Here is a comparative example: Shape No. 2 in the accompanying illustration is a simple heavy section, weighing 1.288 pounds per foot. Shape No. 4 is a thin intricate section, weighing only 0.282-pound per foot. Under the former pricing system, Reynolds advises, the price per pound was the same for both of these sections. Yet, the die costs, press time, heat treating, straightening, inspection and packing costs are less for the heavy simple section. The new system takes these factors into consideration, and Shape No. 2 is priced considerably lower than Shape #4. Under the old system the price is

(Please turn to page 198)

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Portable Electric Hand Lamp



Model 211

Big Beam is the accepted standard in portable illumination. A powerful, searchlight beam or a bright spread light—either is instantly available through the convenient, finger-tip control on the adjustable head. These lights are well built for long service, attractively finished, weatherproof, and lightweight for easy carrying.

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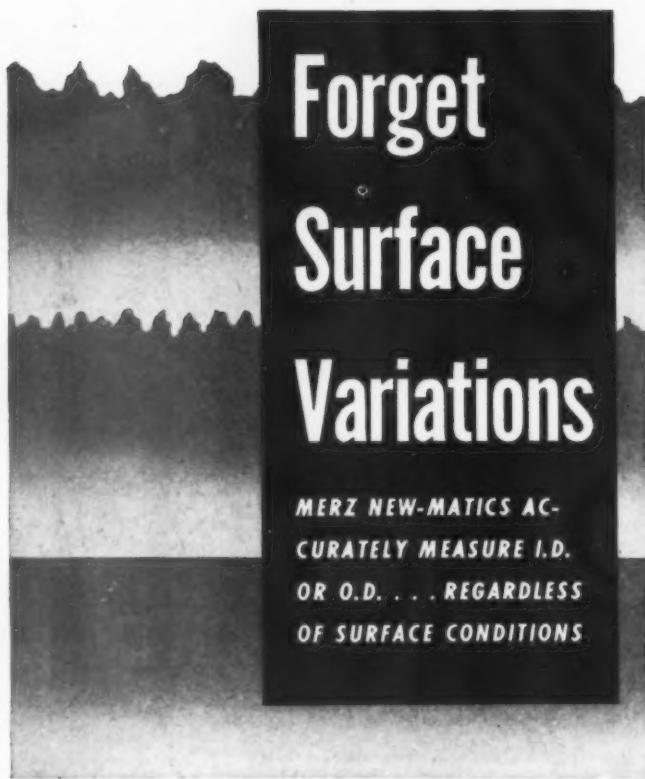
- Hi-Micro (mirror-like) finish on faces of anvils and spindles to insure more accurate measurement.
- Threads hardened, stabilized and ground from the solid.
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MERZ "Master" New-Matic Measuring Machine. Other models for every inspection purpose.

(Continued from page 196)

\$0.332, and under the new system \$0.320 for shape No 2; while the price for shape No. 4 which under the old system was \$0.332, has been raised to \$0.385. Shape No. 1, weight 1.067 lb. per foot, and Shape No. 3, weighing 2.280 lbs. each cost \$.332 under the old system, and \$0.320 and \$0.370, respectively, under the new system. Thus, the heavy simple sections are lower priced than previously, and complicated sections are priced higher.

Shape	Weight	Old System	New System
# 1	1.067	\$.332	\$.320
# 2	1.288	.332	.320
# 3	0.280	.332	.370
# 4	0.282	.332	.385

1 1 1

INDEX AND GUIDE TO ENEMY PATENTS

A compilation of abstracts of 358 United States patents formerly owned by nationals of enemy countries and seized by the Department of Justice, Office of Alien Property, since 1945 is now on sale by the Office of Technical Services, Department of Commerce, Washington, D. C. Most of the patents are available for licensing to American firms by the Office of Alien Property on a royalty fee, non-exclusive basis for the remaining life of the patents.

The abstracted patents in the compilation are classified into broad groups such as "Chemicals and Allied Products", "Electrical Machinery, Equipment and Supplies", "Metals and Metal Products", etc. Refrigeration, automotive, aeronautics, textiles, paper making, photography, food processing, and electronics are among the fields covered.

Copies of the compilation (Report PB-88841, List of Vested Patents Available from Office of Alien Property, 85 pages) sell for \$4. Orders should be addressed to the Office of Technical Services, Department of Commerce, Washington 25, D. C., accompanied by check or money order payable to treasurer of the United States.

A leaflet called "Index and Guide to Enemy Patents vested in the Attorney General as of January 1947" which contains general information about the availability of enemy patents, is available free of charge from either OTS or the Alien Property Custodian.

1 1 1

IRON AND STEEL EXPOSITION TO BE IN CLEVELAND

The annual Iron and Steel Exposition and convention of the Association of Iron and Steel Engineers will be held in the Public Auditorium, Cleveland, Ohio. September 28th-October 1, inclusive. The forthcoming exposition it is stated will really represent most of the technical advancements and improved equipment produced since 1941. More than 200 exhibitors have arranged for display space and an attendance of 12,000 or more steel plant officials and suppliers is expected.

(Please turn to page 202)

The new Approach to

SULFONATIONS and Sulfations



Less than twelve months ago General Chemical Research introduced SULFAN—Stabilized Sulfuric Anhydride—to the Process Industries. Even in that short space of time, many using SULFAN have predicted it may well "rewrite the book on sulfonation and sulfation!"

Important among the many reasons for this belief is the fact that SULFAN provides Sulfur Trioxide in stable, easy-to-use liquid form for the first time in chemical history.

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Already finding a place in the textile, dyestuff, detergent, pharmaceutical, plastics and general organic chemical

industries, SULFAN may hold a rich potential for your operations, too. Write for samples or commercial quantities.

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W. H. Reeves, Vice President
of Easy Washing Machine Corp.

He sells He uses

When a prospect for an Easy washing machine asks "What about service?", the dealer has a potent answer. For W. H. Reeves, Vice President in charge of sales, Easy Washing Machine Corporation, has built a strong, fast-moving dealer service organization. The use of standard washing machine motors is one of the things that helps Easy dealers to give dependable service. With standard motors the service man can take full advantage of the motor manufacturer's motor-exchange and repair-service plans—plans which take the headaches, and delays, out of motor repairs or replacement. He can be sure that the motor he puts back on the job will perform as it should.

More for your money with STANDARD

GENERAL ELECTRIC is now producing *definite-purpose* motors, such as oil-burner motors, jet pump motors, hermetics and the others shown below, as well as 11 types of general-purpose motors. These are being made in *standard designs*. Ratings, performance standards, dimensions, and special features (such as type of enclosure, bearings, etc.) follow the standards worked out by the National Electrical Manufacturers Association in conjunction with your industry associations. Thus, you get all the advantages of standardization and—more than 1600 General Electric standard motors to choose from.

Here's Proof That Standardization Works!

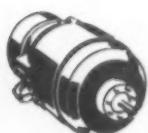
Since the beginning of 1948, General Electric has



Fractional Horsepower MOTORS

cut the price of its fractional-horsepower motors *twice*—5% each time! With fewer "special-purpose" motors to build, G.E. has been able to concentrate on the motor types most widely demanded. The resulting savings are passed along to you and your customers in the form of worthwhile price reductions. Thus, a prime objective of standardization is achieved—more goods for more people at less cost!

New Bulletin Describes Standards We have prepared a brief, but concise bulletin which tells what the standards are and how they are applied. Ask your local G-E office for Bulletin GES-3565 or write *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*



Unit-Bearing Fan



Washing Machine



Oil Burner



Machine Tool



Gas Pump



Hermetic Refrigeration

with more confidence

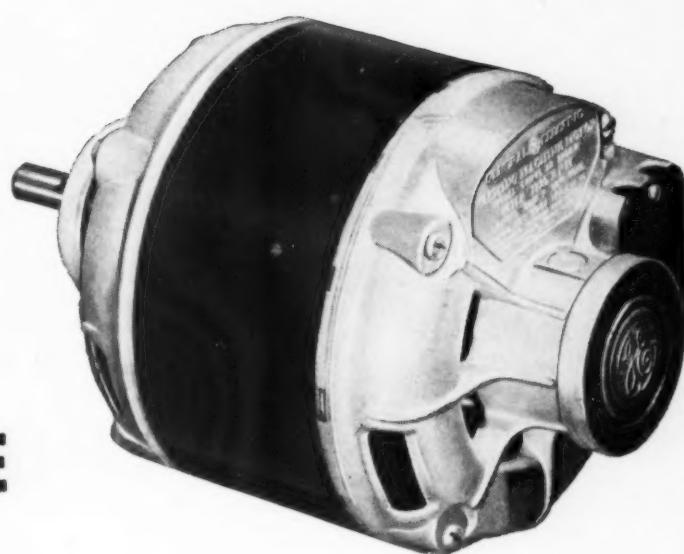
STANDARD



WASHING MACHINE MOTORS

"NEW!" This lighter weight General Electric standardized home laundry equipment motor is smooth operating and power packed. For example, the starting winding is glass-insulated for high heat resistance under heavy starting and accelerating load conditions. Ample torque is provided. No maintenance is required—the motor is permanently lubricated at the factory and is designed to operate for the normal lifetime of a washing machine without any attention.

GOES ON EASILY! G-E standardized washing machine motors meet all NEMA standards for domestic washing machine motors. To facilitate assembly of



the motor coupling, a special shaft is provided which is equipped with a flat and also a drilled hole parallel to the flat. Connection studs are located in a cast-in terminal box on the end opposite the shaft. Motors for all commercial frequencies and direct current are the same over-all length.

OPERATING DATA! Starting torque is 24 oz feet for 60 cycles; speed is constant; rotation clockwise facing end opposite drive shaft is standard. Counter-clockwise on request. For further data, mounting dimensions, etc. call or write your nearest G-E field office. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

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Plant Managers Like Kex Service because it fits into their plan for smooth, efficient plant operation—makes for better housekeeping.

Plant Engineers Like KEX Industrial Towels because they're made for wiping—are safe to use—have no ragged edges to get caught in machinery, and are so soft they will not mar delicate surfaces.

Purchasing Agents Like KEX Rental Service because it provides a constant, reliable, orderly source for scientifically clean wiping towels.

Follow the lead of industrial leaders who overlook no opportunity to keep operating costs down—and efficiency up. GO KEX.



Nothing to Buy—No Expensive Inventory—Just a Low Monthly Rental. The first month should show a decided saving on wiping towel costs.

For complete information, see your classified Telephone Directory for nearest KEX distributor, or write KEX NATIONAL SERVICE, 295 Fifth Avenue, New York 16, N.Y.

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A. S. A. INCORPORATES

The American Standards Association, New York, N. Y., became the American Standard Association, Incorporated, August 2, through incorporation under the laws of the state of New York. The association was organized in 1918 as the American Engineering Standards Committee. In 1928 a reorganization resulted in changing the Committee into a full-fledged American Standards Association, the nation's clearing house for standards and the U. S. medium for international contacts on standardization.

The association's coordinating functions now extend to standards in the mechanical, electrical, building, photographic, mining, safety and consumer goods fields, as well as such general work as that on office equipment and abbreviations and symbols for use in engineering and scientific literature.

Vice Admiral G. F. Hussey, Jr., (USN, ret) is secretary and administrative head.



ANNOUNCE 4-COLOR PRESS TO MAKE CARBON INTERLEAVED FORMS

Construction of a 17", 4-color rotary press which makes it possible to use three colors on carbon interleaved forms and obtain hairline register between colors, is announced by Arthur J. Gavrin Press, Inc., 50 Webster Avenue, New Rochelle, N. Y. The machine also has two numbering units, one of which will number on the face and the other on the back of the form, or both on face.



SECOND ANNUAL PROTECTIVE PACKAGING COMPETITION

Some 150 or more entr'ees are expected in the Second Annual Protective Packaging Contest, conducted by the Industrial Packaging Engineers Association, which is being conducted in connection with the Association's Third Annual Industrial packaging and materials handling exposition at Hotel Sherman, Chicago, during the week of October 4th.

The competition entries include the following groups: Corrugated or Solid Fibre Boxes; Nailed Wood Boxes; Wirebound Boxes, General—which permits entries manufactured of a combination of any materials or reinforcements including metal containers, fibre drums, wooden barrels, palletized articles, bundles, crates, etc.; and Export Package, in which entries must be specially designed for export shipment.

Aside from the contest and other exposition features, there will be a Packaging and Materials handling "Short Course" conducted by the University of Illinois-Extension Division, plus numerous exhibits of products in the Protective Packaging and Materials handling fields.

Information regarding the contest and the "short course" may be obtained from the Industrial Packaging Engineers Association, 20 W. Jackson Boulevard, Chicago 4, Ill.

(Please turn to page 204)



These 'Drill Masters' Develop Precision in Wickwire Rope

The workability and durability of wire rope is largely dependent upon accurate coordination of each wire in the rope. Because off-size wire can cause excessive friction and internal rope wear and early failure in service, every wire must be perfect in shape to fit into the exact geometric construction pattern of the rope.

Knowing this requirement—and knowing *how* to meet it—rests to a large extent with the men in the Die Department at Wickwire. These skilled craftsmen are perfectionists gifted with a passion for accuracy. Using special precision machines (some designed by men in the department), these patient, keen-eyed 'drill masters' create wire drawing dies drilled and ground to an accuracy within .0003 of an inch.

Such scientific precision characterizes every step in Wickwire Rope production. Small wonder then, that it is the choice of those who demand the utmost in performance, safety and long life. You can depend upon Wickwire Distributors and Rope Engineers for practical help in solving your wire rope problems. See your local Wickwire Distributor for Wickwire Rope in all sizes and constructions, both regular lay and WISSCOLAY Preformed.

THIS 82-PAGE BOOK ON WIRE ROPE IS FREE. WRITE FOR YOUR COPY TODAY!

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One Hundred Years is a mighty long time. It also can be a rather uneventful span... nothing of much importance is recorded between 847 and 947 A.D. It can also be a century of great events and progress—1847-1947, for example. And this is the period of our experience in manufacturing bags of all kinds for American industry and agriculture.

This experience is a very important part of the background that your technically trained Chase Salesman brings to bear on your packing problems. Whatever your packing needs may be, Chase can provide an efficient and economical container for your products. It will pay you to check with your nearby Chase Salesman.

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MATERIALS HANDLING SEEN AS KEY TO LOWERED PRODUCTION COSTS

Savings in materials handling offer industry the key to a reduction of its overall production costs speakers emphasized at a technical session of The American Society of Mechanical Engineers, in Milwaukee.

Frank M. Blum, manager of the crane sales division of the Harnischfeger Corp., Milwaukee, in a paper on "Materials Handling Through the Air" described the various types of monorail hoists and overhead traveling cranes. He said:

"Time study men all over the country are trying to see how the machining time of various pieces of manufactured goods can be reduced in order that the cost of that piece might become lower and the ultimate cost to the consumer reduced."

"A recent survey in 120 factories revealed that materials handling costs, in the average plant, are actually about 36.3% of the overall production cost instead of the 25% that had been previously acknowledged by industry. Engineers are becoming more and more conscious of the cost of materials handling. They are looking for other places for savings, and certainly the savings in materials handling in a plant are vast."

Illustrating, he said that man flew from Cleveland to Detroit in 28 minutes, but it took him nearly three hours extra in time consumed in finding transportation, getting to and from airports, handling luggage and waiting for the plane.

"Figuratively speaking," the 'machine time' was excellent but here is the catch. The entire trip took 28 minutes actual flying time, plus 2 hours and 50 minutes 'handling time.' The handling time was way out of proportion to the machining time."

He urged that in purchasing materials handling equipment, it should be evaluated on a basis of service duty classification, keeping in mind the use for the job to be performed, rather than on initial expense.

THIRD NATIONAL PLASTICS EXPOSITION IN NEW YORK

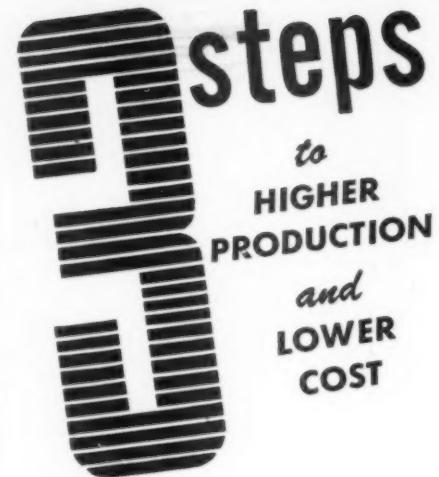
The Society of the Plastics Industry, Inc., New York, announces that the Third National Plastics Exposition will be held in Grand Central Palace, New York, September 27—October 1, inclusive.

The exposition is being planned as a purely trade and industrial show, emphasizing recent strides made by the plastics industry in various fields, as well as its potential development. The slogan of the exposition is "Progress With Plastics."

Featured will be the latest in modern machinery and displays of finished products including fabrics and latest developments in molded products. The general public is not invited.

All of the fabricating processes—low pressure and cold molding, extruding, bending, coating, calendering, low pressure laminating, cast resins, and new applications of infra-red techniques will be demonstrated.

(Please turn to page 206)



1. *Consult* the Milford free engineering service



2. *Choose* one of 15 basic Milford rivet setting machines—offering unlimited versatility.



3. *Select* exactly the right semi-tubular or split rivet or cold-headed fastener from Milford's complete line.



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An absorbent filler holds oil in the reservoir and prevents over-lubrication. Self-lubricating bearing surface for the collar is provided by a shoulder on the bronze bushing.

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Mishawaka, Indiana

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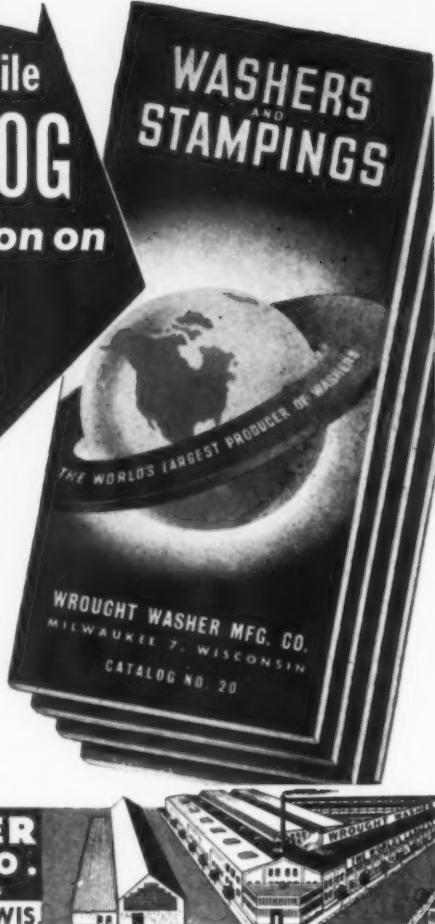
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FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY,
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SYNTHETIC VARNISH FROM
 PETROLEUM DEVELOPED BY SHELL

Petroleum research again has come to the aid of the world shortages. Through the development of the first completely synthetic varnish, it is now possible to manufacture paints and other protective surface coatings without using natural oils.

Paint and varnish makers have used enormous quantities of linseed, cotton and soybean oils in the past, some of which are in great demand as food. Recent advances in petroleum chemistry have made available basic synthetic chemicals that can be substituted for these materials which have been in short supply despite heavy imports.

The latest development is a synthetic varnish based on glycerol alpha allyl ether, made entirely from petroleum. It is a product of the laboratories of Shell Development Company in Emeryville, California. Announcement of the new achievement was made to the American Chemical Society recently in a paper by H. Dannenberg, T. F. Bradley, and T. W. Evans, who directed the research.

Shell Development's many contributions of petroleum synthetics include a series of ketone solvents, aromatic hydrocarbons, and synthetic glycerol, all of which have been valuable aids in meeting the paint and varnish industry's shortages of raw materials.

Glycerol alpha allyl ether, the newest of these petroleum chemicals, is made from propylene, a petroleum gas. Tests show that varnishes made from this new material give a surface of unusual hardness, good flexibility, and extreme toughness. They can be used on glass, wood, steel, tin, aluminum, or copper. Clear, as well as colored, varnishes can be prepared.

The new chemical can be employed in modern paint manufacture with comparative ease, only minor alterations being needed in existing factory equipment.

1 1 1

CHEMICAL EXPOSITION TO BE
 HELD IN CHICAGO

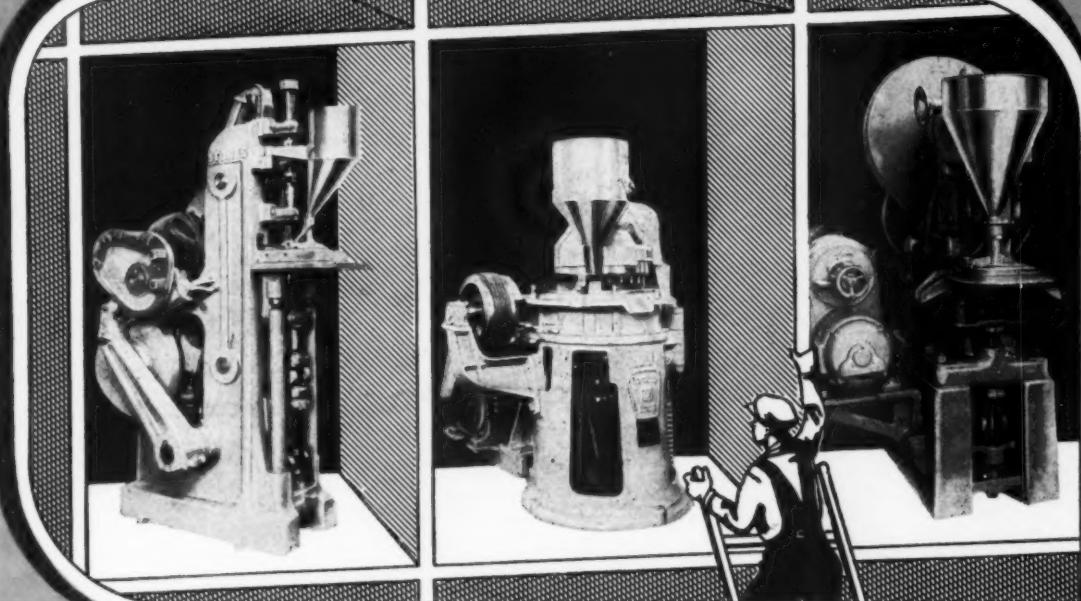
Feature of the forthcoming National Chemical Exposition which is to be held in the Chicago Coliseum October 12-16, 1948 will be a newly created "Technical Bureau" which will provide a personal information service to all who attend the exposition, with Dr. Ward V. Evans at its head. It is intended that the technical bureau personal service will speed up the finding of solutions for problems that may be presented.

Program sponsored by the National Industrial Chemical Conference will run concurrently with the exposition. The program, also to be held in the Coliseum, is designed to be of particular help to non-chemical (chemical consuming) industry and small business firms. There will be talks on "Chemical Markets", "Chemicals in General Industry", and "Hazards from Chemicals", presented by various authorities, and papers on the subject of "Management of Research" and under the general heading of "Frontiers of Chemistry."

(Please turn to page 208)

ASK
STOKES

You don't buy Powder Metal Presses "OFF THE SHELF"



A PRESS too large or too small for your long-term needs will show in the cost of every unit it produces. For advice on how you can use powder metal at a profit in *your* business; for help in press selection, punch and die design, powder formulas, or related problems . . . consult Stokes.

Here at Stokes you draw on the accumulated experience of more than half a century in press design and operation. Your problem goes through a semi-plant-scale testing laboratory guided by the engineering skill which has pioneered in this field since 1920.

Recommendation is then made of the right press from the *complete* line of Stokes specially designed presses for powder metal work.

Stokes also makes Molding Presses, Industrial Tablet Machines, Vacuum Pumps and Gages, High Vacuum Processing Equipment, Tube Fillers, Pharmaceutical Equipment, Water Stills, Special Machinery.

For the right powder metal press for your job, consult with F. J. Stokes Machine Co., 5909 Tabor Road, Philadelphia 20, Pa.



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EXTINGUISHERS BUILT UNDER WAR-TIME SPECIFICATIONS

Wartime control of critical materials made it necessary for Underwriters' Laboratories to temporarily accept substitute materials and to recognize modified requirements of design or materials. The acceptability in each case was made the subject of examination and test of the product and its performance as altered. In these tests emphasis was placed on safe and adequate performance, although some relaxation of usual standards of endurance of length of service was occasionally necessary.

Labeled products embodying emergency alternate features were identified by the letters "EAS" (Emergency Alternate Specification) appearing on the label, and accompanied by the year of manufacture.

Soda-Acid Extinguishers—No changes from the Standards of Underwriters' Laboratories, Inc., were authorized for labeled 2½-gallon soda-acid extinguishers, and therefore the few made during war years should be satisfactory.

Foam Extinguishers—In compliance with instructions of the War Department, a number of changes were incorporated in "EAS" 2½-gallon foam extinguishers. These units contained little or no brass or copper. The inner chamber was of vitreous enameled steel. The life of this part may be expected to be less than that of standard construction, and it may require early replacement. Failure of this inner chamber will be by corrosion, and with instructions of the War Department, slowly; this will reduce or destroy the effectiveness of the device but will not necessarily constitute an accident hazard. The condition will be apparent upon inspection.

The outer shell or tank of this unit is of steel, hot-dip galvanized after forming. It is quite heavy. On account of the increased likelihood of corrosion, all of these units carry the following warning, which forms part of the instructions:

"WARNING—This tank is built of steel to conserve copper. When recharging, wash thoroughly and examine for signs of corrosion. If corrosion spots appear, the tank should be returned at the owner's expense to the manufacturer for examination and test before being recharged. A corroded tank should not be used. It may be DANGEROUS."

These instructions should be followed, and the extinguisher retired from service when corrosion becomes evident. Current reports indicate that little or no trouble from this cause has yet developed.

General:

REPAIRS TO DAMAGED SHELLS—In the interests of safety, shells of any extinguisher that have been damaged, mechanically, by freezing or otherwise, should be discarded, not repaired.

HYDROSTATIC TESTS ON 2½-GALLON EXTINGUISHERS—Manufacturers test these extinguishers to the pressure indicated on the nameplate, which is at least 350 lb. per sq. in. This pressure is held for 1 minute. This pressure is not recommended for periodical retesting since weakening of the extinguisher is known to result from repetition of heavy stresses.

(Please turn to page 210)



Large eastern manufacturer connects waste heat boiler and mill with transmission pipe insulated with K&M "Featherweight" 85% Magnesia and K&M Hy-Temp.

Superheated steam travels nearly 2 miles

*Another job for
K&M "Featherweight" 85% Magnesia*

Here is a real job for insulation. A 16" superheated steam line almost two miles long at 275 pounds pressure and a temperature of approximately 650°F. Just another case where 85% Magnesia and Hy-Temp Insulation were selected to give maximum results under exacting circumstances.

The pipe line illustrated above presents one of those extreme conditions where insulation is called upon to minimize heat losses with seasonal temperature changes varying from zero to 90°F. In this instance a 3-ply outer covering of Asbestos Roofing Felt is used as a protection against the elements.

K&M Distributors, located strategically throughout the country, are experts on the application of K&M insulation materials. Let them help you gain substantial savings in your plant. Write for full details.

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*Nature Made
Asbestos—*

Keasbey & Mattison
has made it serve
mankind since 1873.



(Continued from page 208)

Test pressures of 250, 200, or 150 lb. per sq. in. have been suggested for periodical retesting. The 150 pound pressure is approximately 1½ times the normal operating pressure of the ordinary soda-acid types and 2½ times the normal operating pressure of foam extinguishers.

This testing should not be attempted unless it is done by those who are familiar with such operations. There is an accident hazard involved, and unless pressures are properly controlled, test gauges reliable and frequently recalibrated, the extinguisher is apt to be over-stressed and become subject to failure in later service. (National Board of Fire Underwriters).

1 1 1

MOLDED NYLON USED FOR WORKING PARTS OF LIGHT MACHINERY

Widespread use of nylon plastic—basically the same material that goes into women's stockings—in working parts of light machinery and equipment was forecast by plastics experts of the Du Pont Company, Arlington, N. J.

Indicative, they said, of a trend toward molded nylon parts that in some applications outwear metal and require no lubrication, was adoption of the material for wheel bearings in a new line of baby carriages.

While this was one of the first bearing applications of nylon to go into commercial production, many other bearing and gear uses are being evaluated and its early adoption is expected in friction parts of light electrical equipment, such as food mixers and shavers.

Use of the material also is being studied in textile equipment where, it was pointed out, the elimination of oil as a lubricant is a major advantage.

Resiliency and surface smoothness are characteristics that make nylon suitable in some bearing and gear applications. No lubricant is required for nylon bearings under light load at high speeds or moderate load at low speeds.

When lubricants are necessary, either oil or water may be used. Motor oils do not affect nylon, nor are oils adversely affected by it. Nylon bearings are recommended for service temperatures as high as 325°F., although in many cases higher temperatures can be tolerated, depending on the application.

The injection molding of nylon bearings permits rapid, large-scale production. The nylon bearings are molded by Machinecraft, Inc., Whitman, Mass., for the Collier-Keyworth Company.

6694

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GREEN CORE
... your
assurance of quality”

Panther and Dragon
friction and rubber tapes

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SEE PAGE 346**

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ROLLING MILLS AND GENERAL OFFICES: PITTSBURGH, PA.

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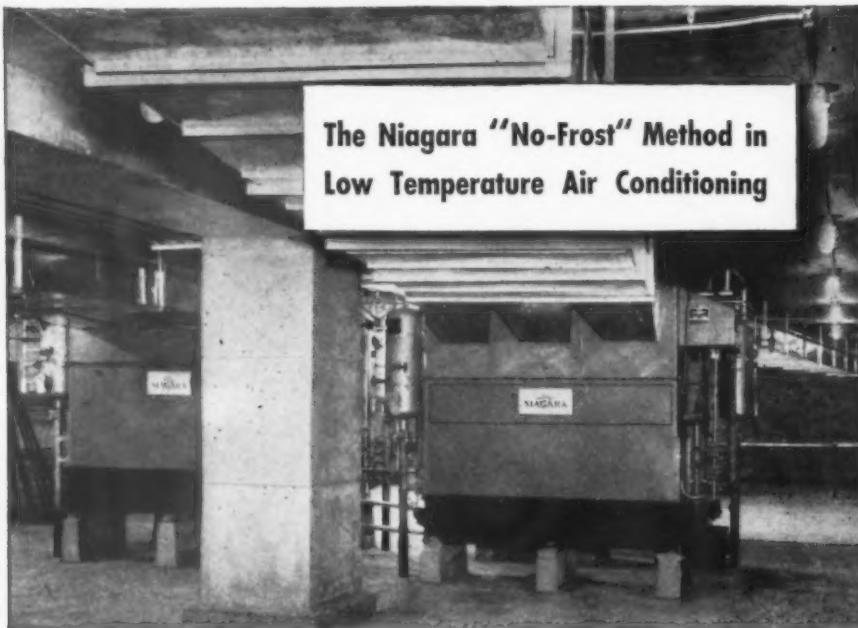


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High Precision Industrial Air Conditioning with extremely dry atmospheres (or with high relative humidities) at low temperatures.

● Specializing for thirty years in the more difficult problems of air conditioning for industrial processes, this Company has developed a group of units that make it easier and less expensive for you to get the particular air conditioning benefits you may need for your special process, or to overcome some obstacle of climate or condition that is interrupting your production or causing loss from rejected parts or materials.

The Niagara "No-Frost" Method, for example, has been used to create temperatures as low as -90° F. in cold test rooms, and to provide air with only 1 gr. of moisture per lb. for special processing.

The Niagara Type "A" Air Conditioner creates any condition of temperature and humidity for a test or process, and if wanted, creates different conditions in different rooms simultaneously.

Some of the industrial applications of these units: internal combustion engines, motors and air craft, super-chargers and carburetors, gas cooling and controlled atmosphere process, film, plastics, fiber, rubber and adhesives control, biological processing such as penicillin, and yeast.

Write for a Niagara Blower Bulletin on a subject which interests you, or for the address of the nearest Niagara Field Engineer.

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MATERIAL HANDLING FILMS

Application of modern material handling machines is the subject of a series of five moving picture films prepared by the Industrial Truck Division of the Clark Equipment Company, 258 Champion Street, Battle Creek, Michigan. The films show electric battery-powered and gas-powered fork lift trucks and towing tractors in operations that include many phases of modern packaging, loading and handling.

The films are available on a loan basis upon request to the Industrial Truck Division. The five titles are as follows:

Material Handling Newsreel, Issue #1, 16mm, black and white, 1050 ft., sound. Material handling methods in varied industries.

Material Handling Newsreel, Issue #2, 16mm, color, 412 ft., sound. Truck loading and unloading, flatcar loading, cargo aircraft loading; palletized units handled by fork trucks and towing tractors; and machine that will tier to 130 inches.

Building the B-29, black and white, approximately 1000 ft., sound. Boeing Aircraft plant, Seattle, Washington.

Modern Material Handling Methods, 16 mm, black and white, 600 ft., sound. Right and wrong way of breaking out a box car, fork truck handling in box car loading, dock operations, warehousing.

Clark Modern Material Handling Methods, 16mm, black and white, 800 ft., sound. Boxcar loading and unloading and warehousing.

Moving White Gold (cotton), black and white, 25 minutes running time, for sound projection only. Machines and methods available to the cotton industry.

NEW, TOUGH SYNTHETIC RUBBER

Tire treads can be made of a new synthetic rubber produced at low temperatures which will outwear the best natural rubber treads, possibly by as much as 30 per cent, Herbert E. Smith, president of United States Rubber Company, announced recently.

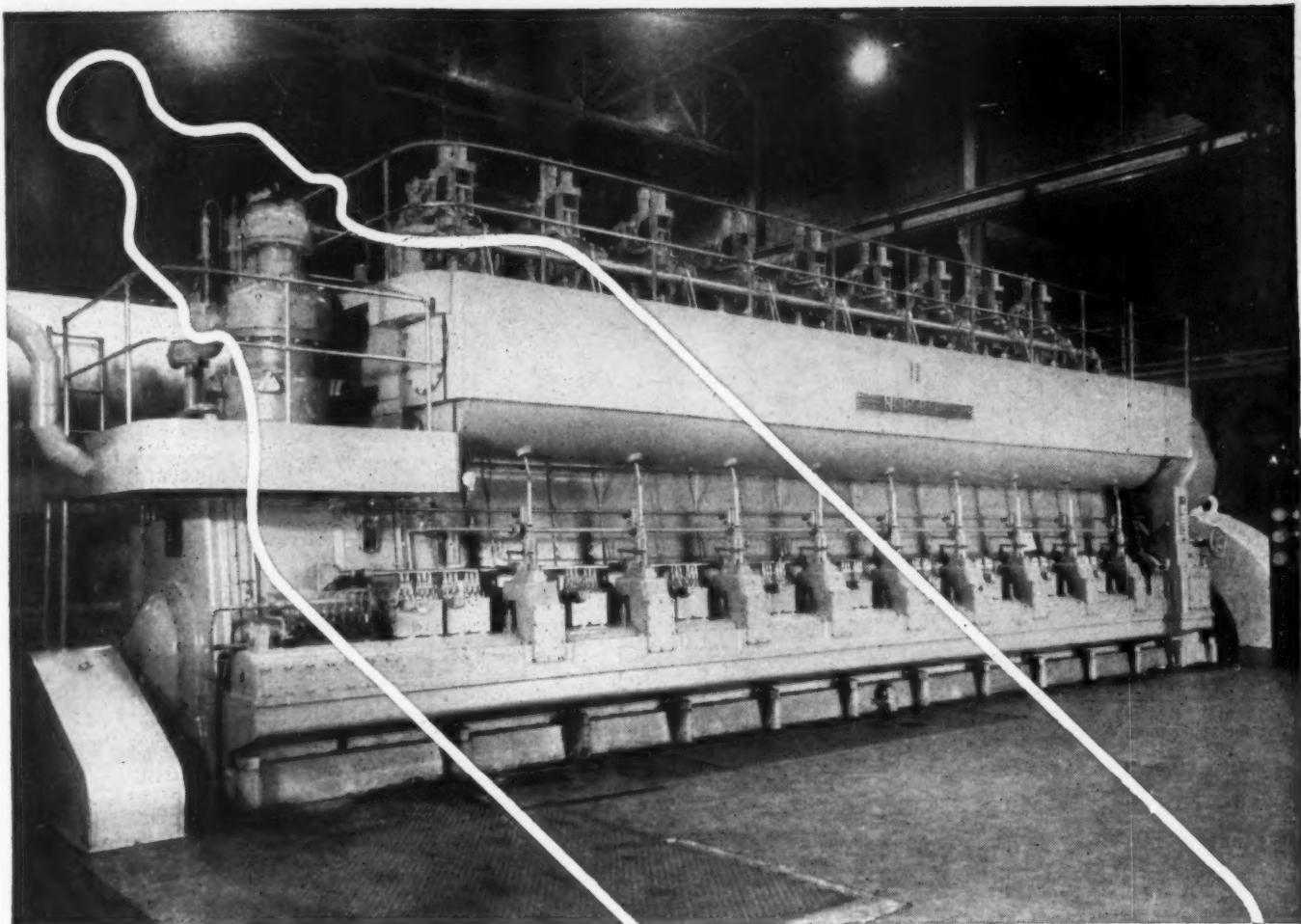
"This looms as the most important development in synthetic rubber research since GR-S, the original general purpose synthetic, was put into production," Mr. Smith said.

"If continued tests prove the new synthetic is as good as it now promises to be, this nation will be much less dependent on importation of natural rubber. Also, the day is brought closer when synthetic rubber will be able to stand on its own feet economically without government support."

The new synthetic rubber is made by the polymerization of butadiene and styrene at much lower temperatures than previously used, Mr. Smith explained. This chemical process changes the structure of the rubber to reduce cracking, and increase strength and resistance to abrasion.

The new rubber was developed by the rubber, chemical, and petroleum industries under direction of RFC, Office of Rubber Reserve. It is being produced in limited quantity at government plants operated by United States Rubber Company at Borger, Texas, and Copolymer Corporation at Baton Rouge, La.

(Please turn to page 214)



FEEDING PROBLEMS...

by Bottle or Barrel

REGARDLESS of size, your plant equipment is an important investment. It's an investment that deserves special "care and feeding." For example, it's not unusual for operators of the "big babies" like this mammoth diesel above to put them on special "formula" diets for protection. When this happens, the services of a seasoned lubrication engineer are helpful.

Cities Service lubrication engineers are thoroughly grounded in up-to-the-min-



We have a new 66 page booklet entitled "Diesel Engine Lubrication." This complete lubrication manual is yours for the asking.

ute lubrication techniques on diesel engines.

They know what proper types and grades of oils, greases and fuels will best meet your individual requirements.

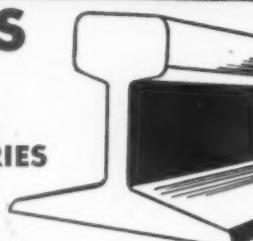
At absolutely no obligation to you, a Cities Service lubrication engineer will make a thorough, on-the-spot analysis of your lubrication requirements. His recommendations may substantially reduce your operation and maintenance costs. Write Cities Service Oil Company, Room 213 Sixty Wall Tower, New York 5, N. Y.

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**EXPECT DOWNWARD TREND IN
 1949 CAPITAL EXPENDITURES**

Capital expenditures by industry in 1949 are expected to show a downward trend, according to the latest monthly survey of current business practices conducted by the National Industrial Conference Board. A majority of the company officers cooperating in the survey look for a decline although a significant proportion expect capital outlay in 1949 to closely approximate that for 1948. A relatively small number are planning on increasing capital expenditures.

Underlying Factors

The general downward trend of capital expenditures after 1948 is attributed to several factors. The high construction costs which prevail are "a severe handicap" on continued expansion of plant facilities. "As a result of this spiral, a structure which cost \$3.20 per square foot to build before the war will now cost a company \$15.20 per square foot." To avoid borrowing funds many companies report that they are constructing only necessary additions to their present plant facilities.

Another reason often mentioned for this "tapering off of capital needs" is the completion of many of the postwar improvement plans which were set up after V-J day. These plans, many of which ran for three years, are reported as being completed late this year and early in 1949. In other cases, "large amounts of capital were expended" to purchase plants which were being leased from the government during and immediately after the war. Still another cause of large capital expenditures was the "retooling required" during the postwar period.

Sources of Capital

Retained earnings furnish the bulk of the capital requirements for more than three quarters of the companies surveyed. Next most important source for funds is "current depreciation." About half of the companies surveyed rely on this method to pay part of their capital expenditures. In practice, most companies report that they use a combination of the two methods to meet a large proportion of their capital needs.

Some of the companies surveyed, about 5% of the total, financed "a substantial part of their capital needs" through stock or bond issues. A few companies stated that they resorted to bank loans and insurance company loans to meet capital expenditures.

Retained Earnings

Companies reporting that earnings reserves took much of their capital expenditures "had to resort to other means of financing as well." Actually, the greater number of these companies point out that earnings did not pay for more than 50-75% of the total capital needs.

Most of the iron and steel companies report that a relatively high proportion of their capital needs were met out of retained earnings. This was also true of textile manufacturers, the majority of whom paid

(Please turn to page 216)

A FULL BLAST OF AIR!



Air nozzle with general purpose nose. Nozzle may be had with any or all of the noses illustrated below.

IMPERIAL
Heavy-Duty
AIR NOZZLE
 with 4 Interchangeable Noses



General Purpose Nose for all ordinary applications.

Long Nose (10 1/2") can be bent for pockets, recesses, etc.

Adjustable Nose for high pressure air lines or where air blast must be controlled.

Wide Flat Nose for broad surfaces.

- ★ **Body Made of Heat Treated Duraluminum Forging**
- ★ **Unusually Strong, Durable**
- ★ **Light — for Ease in Handling**
- ★ **Safe Comfortable Grip**

For hard use and long life in machine shops, steel mills, foundries, forging plants, factories, garages, repair shops, service stations, etc. Has 4 quickly interchangeable noses. Neoprene washer withstands oils and acids in air. Self-cleaning seat. For all air lines. Has 1/4" female I.P.T.

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 See Your Industrial Supply House

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Where perfect fit means perfect service...



Bristol socket screws are made to meet all accepted standards for tolerance. This means greater ease in installation — a snug fit with tighter grip — regardless of the number of times the screw must be removed and replaced. That's why Bristol Hex Socket Screws are the choice of men who demand dependable performance on the job.

PRECISION THREADING. Bristol—famous for over 59 years as a maker of precision instruments — demands the same careful workmanship in its socket screws as in its instruments. Proper design, standard tolerances and precision threading assure socket screws that are uniform . . . spin easily into place . . . fit perfectly . . . wrench up tightly . . . hold firmly.

CRITICAL INSPECTION. The use of a special alloy and heat treatment of the finished product insure the proper balance of hardness and toughness to give great holding power and long service under severe conditions. This is backed up by a critical inspection system: physical testing of raw material . . . checking of tolerances during production . . . testing for hardness and ultimate strength . . . gauging for lead and pitch . . . plus visual inspection before packing.

FULL RANGE OF SIZES

"Hex" Cap Screws — No. 4 to 1"



"Hex" Set Screws "Hex" Pipe Plugs
No. 4 to 1" 1/16" to 1 1/4"

Order from your distributor. THE BRISTOL COMPANY, Mill Supply Division, 132 Bristol Rd., Waterbury 91, Connecticut.

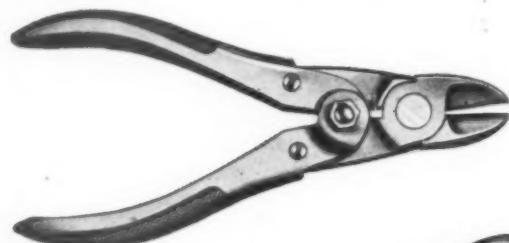
are your HAND OPERATIONS COSTLY?



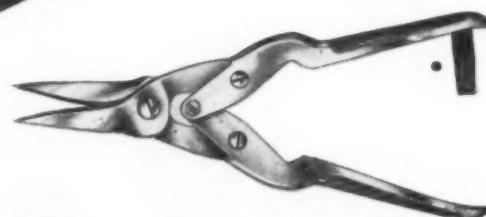
BERNARD Parallel Action PLIERS (#102). Jaws close parallel like a vise. Cutters on outside of head for easy, quick use. Compound leverage action doubles gripping power.

These are the days when seconds saved in hand operations help combat rising costs of manufacture. Have you studied your hand operations recently with a view to increased efficiency?

BERNARD hand tools are saving time and money in thousands of plants — because they do the job quicker or better or both — and because *quality and long life* are built into them.



BERNARD Metal Snips (#888 — 10 1/4") have spring action and compound leverage. Blades are so bevelled as to permit easy cutting of curves in either direction.



BERNARD Diagonal Cutting Nippers (#177 — 5 1/4") have lively spring action and compound leverage to keep hand fatigue at a minimum in repetitive operations.

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SARGENT & COMPANY, (SCHOLLHORN DIV.)
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(Continued from page 214)

for about 65% of their capital expenditures with retained earnings. On the other hand, the majority of petroleum companies (all of which are comparatively large concerns) pay for "only about one third of their capital needs" from retained earnings.

Depreciation Reserves

Depreciation reserves provided for funds for anywhere from 6-75% of the total capital expenditure for the reporting companies. The greatest number reported that depreciation reserves accounted for about 35% of their capital outlay. Many companies that extract natural resources, such as the mines and oil concerns, pay for "a substantial proportion of their capital requirements from liberal depletion charges."

The companies resorting to public flotation to secure capital are in most cases large, well-known concerns. The typical company in this group accounted for 45% of its capital needs through stock or bond issues.

Those companies which used short-term bank financing to meet capital needs stated that they secured, on an average, about 46% of their capital needs by this method.

A handful of companies reported that long-term bank loans furnish a portion of their capital needs. The average company in this group secured about half its capital from this source.

Some companies mentioned other sources for funds. Large insurance loans were used in several cases to finance building costs while retained earnings and depreciation charges were sufficient to meet other capital needs.

Effect of Rearmament

The rearmament program is not expected to increase the capital needs of most of the companies surveyed. According to many of the cooperators, the expansion which was carried on during the last war emergency and the recent postwar period "has been sufficient to take care of any additional production which might be necessary in the near future."

The general belief is that a rearmament program will require "increasing use of second and third shifts and stepped-up production schedules" rather than expansion of physical plant facilities.



A.M.A. CHOOSES MALCOLMSON PACKAGING VICE-PRESIDENT

J. D. Malcolmson, technical advisor of the Robert Gair Company, Inc., New York, N. Y., has been chosen a director and vice-president of the American Management Association in charge of the Packaging Division. He succeeds the late Edgerton A. Throckmorton.

YOU WILL FIND NEW
SUPPLY-SOURCES LISTED
EVERY MONTH IN
PURCHASING'S CLASSIFIED
SECTION! SEE PAGE 346

Get it from CRANE . . .

for quality in every piping item

It's as simple as that! *Everything* from Crane is the easy way to specify "Quality" in all piping equipment. Whether it's valves, fittings, accessories or fabricated piping . . . one catalog and one order quickly bring everything you need from your nearest Crane Branch.

This boiler feed system, for example, shows how completely Crane fills your piping needs, regardless of the fluids to be handled. For Crane offers the world's most complete selection of brass, iron, steel and alloy piping materials. Standardizing on Crane gives you this 3-way advantage:

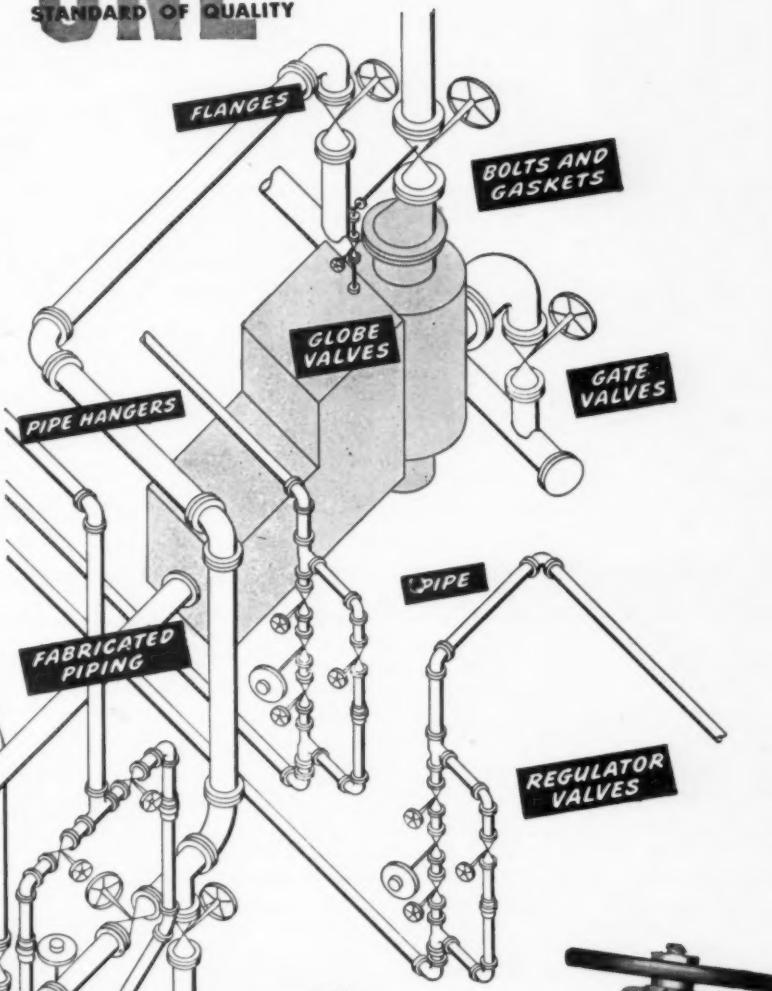
ONE SOURCE OF SUPPLY helps to simplify all piping installations—from design to erection to maintenance. Expedites purchasing and store-room procedures.

ONE RESPONSIBILITY for piping materials helps to get the best possible installation and to avoid delays on the job.

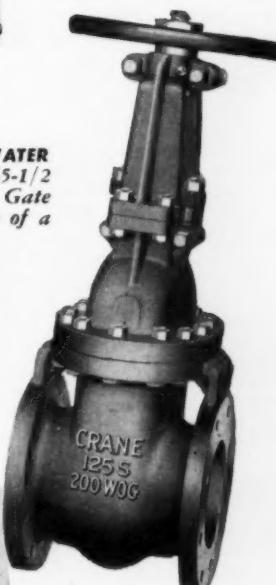
OUTSTANDING QUALITY in every item from Crane assures uniform efficiency and dependability throughout any piping system.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

ONE
SOURCE OF SUPPLY
RESPONSIBILITY
STANDARD OF QUALITY



RECOMMENDED FOR FEED WATER SERVICE — Crane No. 465-1/2 Standard Iron Body Wedge Gate Valve with brass trim. One of a complete line for steam pressures up to 125 psi; for water, oil, or gas up to 200 psi. Made in outside screw and yoke, and non-rising stem patterns; screwed or flanged ends; brass trimmed or all-iron. In sizes 2 in. and larger. See your Crane Catalog, p. 101-6.



EVERYTHING FROM . . .

VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

CRANE

FOR EVERY PIPING SYSTEM

Fig. 210 R.H.B.
Steel Stool



Fig. 200 S
All Steel Stool



Steel Work Bench
Fig. 732
Pat'd. Pats. Pend.
Drawer is extra.



HALLOWELL

ALL-WELDED, "WABBLE-PROOF" CONSTRUCTION . . .

The ready-made "Hallowell" Work-Bench of Steel is the ideal bench for your shop. "Hallowell" Benches have smooth steel tops; are also available with beautiful laminated wood tops; or steel tops covered with "Tempered Preswood". The "Hallowell" is made in four standard heights, three widths and seven lengths . . . does not require costly bolting to the floor . . . and can be easily moved, rearranged and joined to form a continuous bench, not practicable with nailed together wooden benches.

"Hallowell" Stools and Chairs of Steel combine the utmost in correct sitting comfort with sturdy, all-welded, wobble-proof construction. Made in a wide variety of styles and types to meet your every "seating" requirement . . . in fixed or adjustable heights . . . with or without back-rests or foot-rests. Ask for the "Hallowell" Catalog.

Write us for the name and address of your nearest "Hallowell" Industrial Distributor.

OVER 45 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

JENKINTOWN, PA. BOX 590

BRANCHES: CHICAGO • DETROIT • INDIANAPOLIS • ST. LOUIS • SAN FRANCISCO

Coleman **LOW COST
OIL HEATERS**
SERVE INDUSTRIAL NEEDS

Need Fast-Action, Low-Cost heating anywhere in your organization . . . in offices . . . shops . . . garage . . . warehouse . . . guard stations . . . field locations? Here's the answer:

Model 444D  **GIVES DOUBLE
COMFORT WITH
RADIANT HEAT - CIRCULATING HEAT**

Circulates 11,000 cubic feet of warm air per minute! Beautiful, streamlined for shop or office. Famous Coleman Low-Draft Burner for high efficiency—Low-Flame Fuel-Saver—removable barometric fuel tank for easy filling.



31,000 heat units per hour!



TWO MODELS—
50,000 Heat Units
and 30,000 Heat Units
per hour!

Models 555A and 333A

Fast-Action radiant heat pours out a flood of warmth right now—especially suitable where circulating heat is impractical . . . as shops, garages and other locations. Sold by Coleman dealers everywhere. Write for descriptive illustrated folder.

THE COLEMAN COMPANY, INC., Wichita, Kansas



The Coleman Company, Inc., Dept. 469 Q
Wichita 1, Kans.

Send me further information on Coleman Oil Heaters
for Industry—no obligation.

Name _____

Address _____



For Office—Shop—Garage



ELECTRIC POWER SUPPLY SITUATION TIGHT BUT ADEQUATE

The electric power supply situation in the United States will be approximately the same for 1948 as it was in 1947—tight but adequate—Charles E. Oakes, President of the Edison Electric Institute, declared in announcing the findings of a third nationwide power survey made by the same Committee of the electric industry's top power experts that precisely forecast months in advance the conditions prevailing last year.

The results of this survey have been made available to the National Security Resources Board at Washington. Summing up the essential points as they appear from the survey, Mr. Oakes said:

"The U. S. has an adequate power supply at present, although reserve margins are narrow.

"There is a remarkably high degree of system coordination to get the most out of all the generating facilities within different areas.

"Everything is being done that can practically be done to add new capacity.

"The turbine factories are loaded to capacity.

"In three years the country will be back to normal reserves.

The fabrication and installation of new generating equipment is proceeding as fast as manufacturing facilities will permit. Steam turbine manufacturers are booked to capacity three years ahead. Generators are being produced at the rate of 5½ million kilowatts per annum for central stations and another ½ million kilowatts for isolated industrial plants.

At the same time the demand for electric power continues to rise month by month. New and expanded uses of electricity are developing and labor costs are a high premium on greater application of electric power. Growth of power demand is expected to nearly absorb the new capacity added during the year. For the country as a whole the margin reserve is placed at 6%.

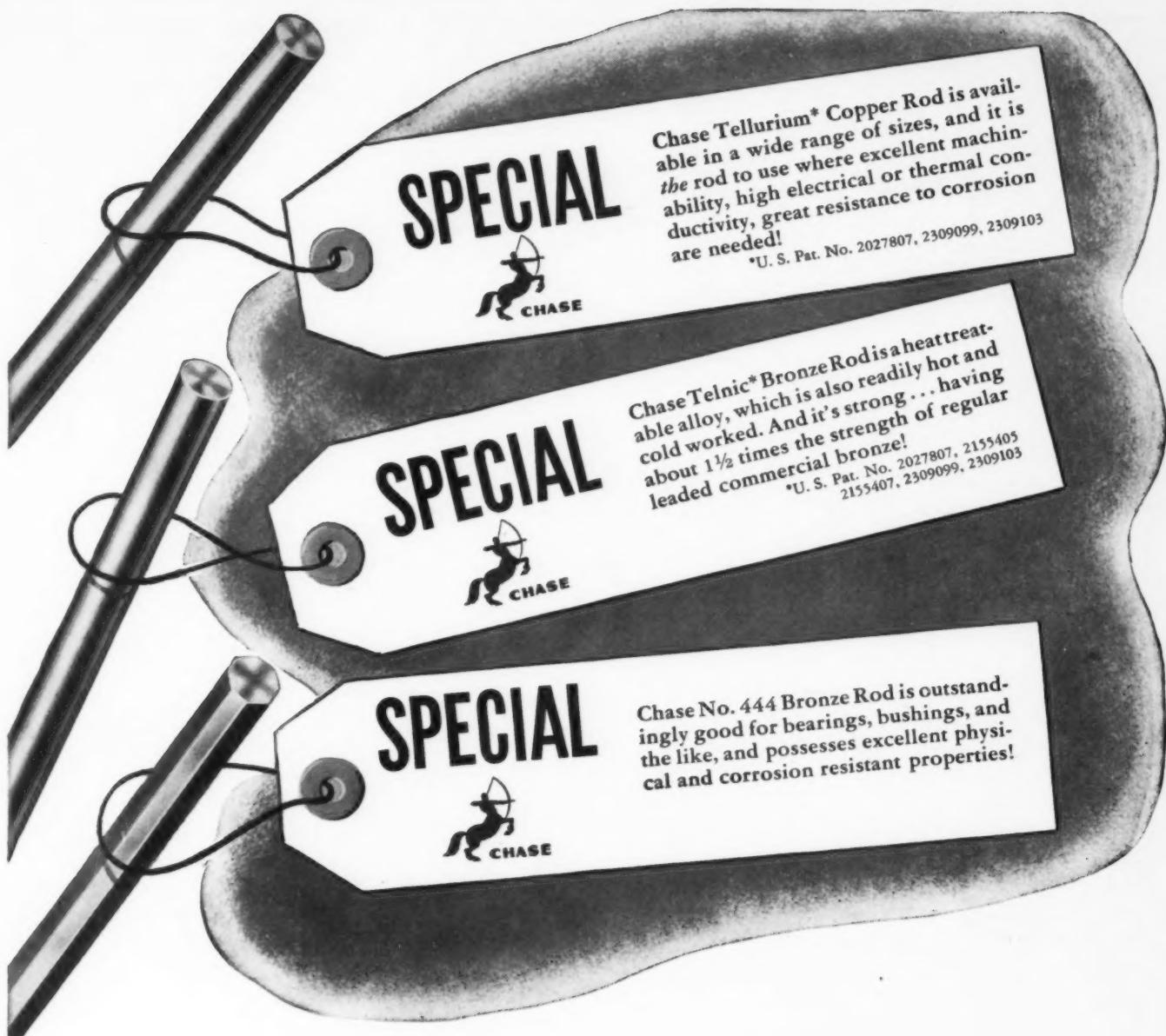
1 1 1

EMERSON ELECTRIC TAKES OVER FORMER WALWORTH PLANT

The Emerson Electric Manufacturing Co. of St. Louis, announces that the United States Air Forces have authorized the activation by the Emerson Co. of the former Walworth Plant at Washington Park, Ill., for the manufacture of aircraft turrets with associated electronic equipment relating to aircraft armament. The equipment to be produced will be directly connected with the new air force 70-Group program, and expansion of the Naval Air Arm. The company has been awarded contracts for the design and production of electronic-controlled aircraft gun-firing mechanisms for new types of jet-powered bomber aircraft, and other planes. It is expected that the work will ultimately involve the employment of 600 people, and provide new equipment and replacement items for a period of five years.

(Please turn to page 220)

PURCHASING



Chase Tellurium* Copper Rod is available in a wide range of sizes, and it is the rod to use where excellent machinability, high electrical or thermal conductivity, great resistance to corrosion are needed!

*U. S. Pat. No. 2027807, 2309099, 2309103

Chase Telnic* Bronze Rod is a heat treatable alloy, which is also readily hot and cold worked. And it's strong... having about 1½ times the strength of regular leaded commercial bronze!

*U. S. Pat. No. 2027807, 2155405
2155407, 2309099, 2309103

Chase No. 444 Bronze Rod is outstandingly good for bearings, bushings, and the like, and possesses excellent physical and corrosion resistant properties!

For those tough jobs...3 Chase Special Alloy Rods ... made to see you through

THESE three special rod alloys were specifically developed to meet certain unusual needs of industry. They were designed to help solve manufacturing problems that *you* may encounter. They typify the kind of service Chase is prepared to offer you.

In addition to these special alloys,

Chase regularly produces—in rod—10 non-leaded alloys, 7 leaded alloys of the highest quality... making it the simplest thing in the world to obtain one or more rod alloys that will do exactly the job you require. Start now to draw upon this wealth of production and research facilities. Call Chase today!

Chase

WATERBURY 91, CONNECTICUT



the Nation's Headquarters for
BRASS & COPPER

SUBSIDIARY OF KENNECOTT COPPER CORPORATION

THIS IS THE CHASE NETWORK... handiest way to buy brass

ALBANY ATLANTA BALTIMORE BOSTON CHICAGO CINCINNATI CLEVELAND DETROIT HOUSTON INDIANAPOLIS KANSAS CITY, MO. LOS ANGELES MILWAUKEE MINNEAPOLIS
NEWARK NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH PROVIDENCE ROCHESTER SAN FRANCISCO SEATTLE ST. LOUIS WATERBURY. (Indicates Sales Office Only)



High Costs Under Low Ceilings

When plant ceilings are low, material handling costs may skyrocket, especially if loads are heavy and movements frequent. If yours is a plant where there isn't headroom to install and operate a conventional type electric hoist, there's an answer to the problem — and a Shepard Niles engineer has it.

Show him what you lift and move. He's a trained, experienced man and from the multitude of sizes and types of electric hoists made by America's pioneer builder, he'll recommend the best type of close clearance hoist to do your job economically, smoothly and safely.

Every Shepard Niles hoist has sound design, rugged and precise construction and trouble-free operation built in. The "plus" you get with a Shepard Niles is the right style and installation for your own needs.

★ If your handling problem involves an overhead traveling crane instead of a hoist, Shepard Niles will suggest the right type. There's a Shepard Niles crane for every material-handling operation.

Shepard Niles
CRANE & HOIST CORPORATION

462 SCHUYLER AVENUE • MONTOUR FALLS, N.Y.

NATIONAL ELECTRICAL SAFETY CODE FIFTH EDITION NOW AVAILABLE

The first five parts of the fifth edition of the National Electrical Safety Code, previously issued separately as National Bureau of Standards Handbooks H31 to H35, are now available in one 408-page cloth-bound volume as NBS Handbook H30. Each of these parts has been approved by the American Standards Association as an American Standard.

The National Electrical Safety Code, prepared originally in answer to the large number of fatalities then occurring among electrical workers, has become almost indispensable in the public utilities field. It is now used by over half of the states in their power transmission requirements, as well as by municipal governments, electric power companies, telephone and telegraph systems, and railways.

The page numbers of the five separate handbooks have been retained in the new compilation to assist in the location of specific code rules regardless of the volume used. Installation and maintenance rules for electric supply stations are given in part 1, for electric supply and communication lines in part 2, and for electric utilization equipment in part 3. Part 4 contains safety rules for the operation of electric equipment and lines, and part 5 covers radio installations. An index to all five parts is also provided. In part 2, strength requirements are given for overhead lines and their supports in all parts of the United States, based upon a long-range study of local wind velocities and weather conditions favoring ice accumulation on wires.

NBS Handbook H30, *National Electrical Safety Code*, may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at \$1.25 per copy.

↑ ↑ ↑

WILLYS-OVERLAND PROCUREMENT DIVISION IS REORGANIZED

The procurement division of Willys-Overland Motors, Toledo, O., has been completely reorganized, according to an announcement by Walter D. Appel, director of procurement.

The move has divided the division into two major groups, one for purchases of productive material and the second for materials classified as "non-productive". The changes are designed to reallocate purchasing responsibility into more logical groupings according to the type of materials bought, Mr. Appel said.

In the productive materials group, M. P. Williams is purchasing agent for stampings and their dies, frames, body assemblies, parts, body hardware, trim, paint and glass.

G. R. Cheetham is purchasing agent for mechanical and electrical units and assemblies, covering such items as complete chassis units, machined parts, electrical equipment, screws, bolts, standard parts, tires and tubes.

J. S. Conant, recently appointed general purchasing agent, will also act as pur-

(Please turn to page 224)



"That was when the 'Old Man' rared up....

"What! No tubing?" he shouted. "Did you try Nikoh?"

He needn't have flared up like that—it was embarrassing to be singled out of the whole meeting. *I* didn't know that we could get tubing from Nikoh by sending them our own steel.

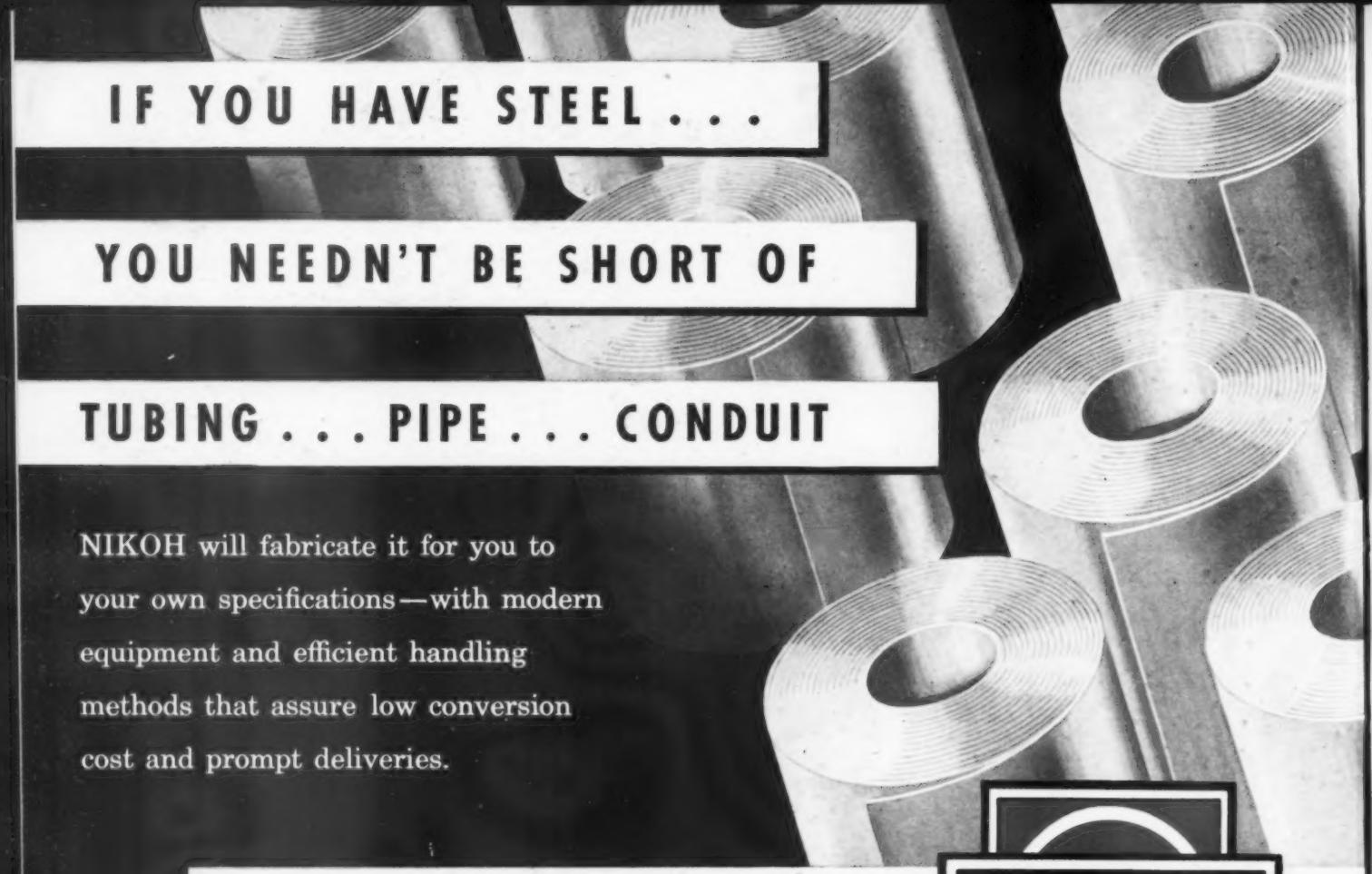
So I'm telling you—don't get yourself on the same spot.

NIKOH makes welded steel tubing up to 4 inches in diameter—pipe up to 6 inches—electric conduit up to 2 inches. NIKOH can fabricate either regular or special shapes



Need TUBING?... Ask NIKOH

NIKOH TUBE COMPANY, 5001 South Kedzie Ave., Chicago 32, Ill.



IF YOU HAVE STEEL . . .

YOU NEEDN'T BE SHORT OF

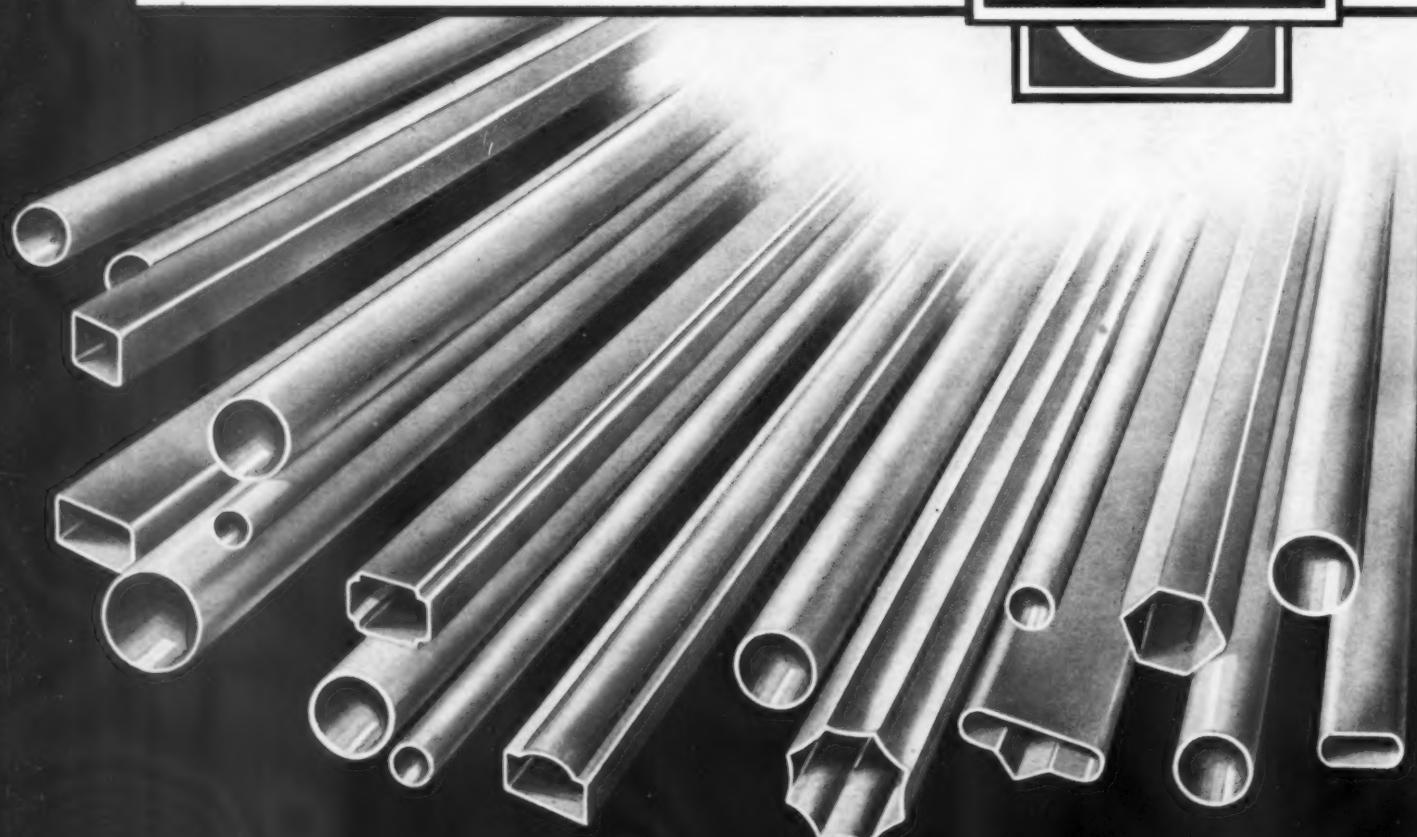
TUBING . . . PIPE . . . CONDUIT

NIKOH will fabricate it for you to your own specifications—with modern equipment and efficient handling methods that assure low conversion cost and prompt deliveries.

NEED TUBING? . . . ASK



NIKOH



NIKOH TUBE COMPANY, 5001 South Kedzie Ave., Chicago 32, Ill.

We Have a Story to Tell You



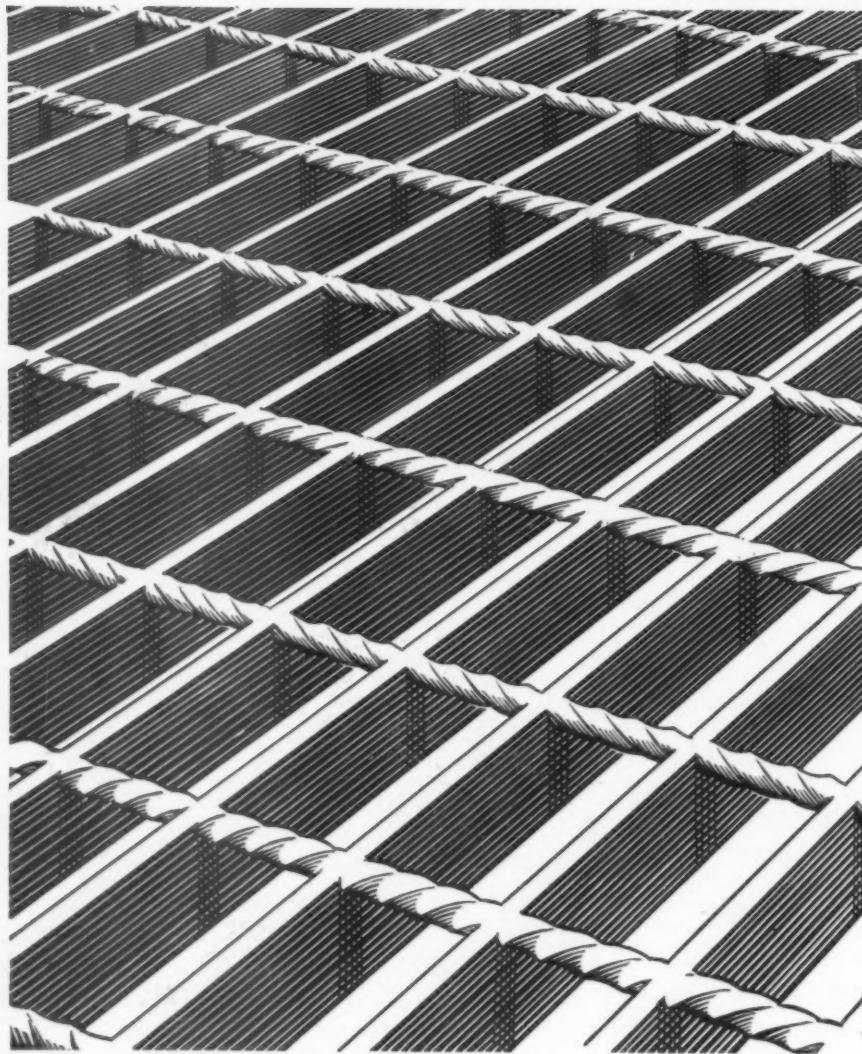
It is a story you will want to hear—because it tells you of added protection and added efficiency at lower cost in the shipping of your products.

In other words, it is the story of SUPERSTRONG boxes and crates—"Bound with Steel."

You will find the full story of the SUPERSTRONG man both interesting and profitable. Write us as to when you wish him to come and see you.



RATHBORNE, HAIR AND RIDGWAY COMPANY
1440 WEST 21st PLACE • CHICAGO 8, ILLINOIS



SEE THOSE TWISTED CROSS-BARS?



FREE...

So that you can have a "close-up" of Blaw-Knox Grating construction, write today for this "paper-weight-size sample" on your business letterhead.

They're electroforged directly *into* the bearing bars to form a rigid one-piece steel "material" of guaranteed strength—with safe footing at all times . . . Blaw-Knox Grating also—

- ★ *Provides Maximum Open Area* for light and ventilation
- ★ *Is Easy to Maintain . . .* easy to paint thoroughly
- ★ *Is Self-Cleaning*—no sharp angles to retain debris
- ★ *Economical to Install* in any size or shape

BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
2075 FARMERS BANK BLDG., PITTSBURGH 22, PA.

BLAW-KNOX ELECTROFORGED STEEL GRATING

(Continued from page 220)

chasing agent for raw materials, including iron, steel, castings, forgings, patterns and dies, lumber and non-ferrous materials.

In the non-productive materials group, H. W. Fels is purchasing agent for office and plant supplies.

I. A. Degner is purchasing agent for capital goods and is also charged with the disposal of obsolete or surplus materials and by-products of manufacture.



MARLIN-ROCKWELL CORPORATION ELIMINATES CASH DISCOUNT

The following notice has been sent out by the Marlin-Rockwell Corporation, Jamestown, N. Y.:

"On account of present conditions we regret the necessity for withdrawing cash discounts effective with shipments on and after August 1, 1948.

"Our standard terms will then be net 30 days—f.o.b. factories Jamestown, New York, and Plainville, Connecticut." Signed—W. B. Mead, Treasurer.



NEW TANNING AGENTS ANNOUNCED BY DU PONT

Synthetic tanning agents which give soft yet strong leathers that can be repeatedly washed or dry cleaned were announced recently by the Du Pont Company, Wilmington, Del. In contrast with leathers tanned by other methods, gentle flexing and stretching are all that is needed to restore the leather to its original softness. These new tanning agents, known technically as aliphatic hydrocarbon sulfonyl chlorides and sold under the trade-mark "Skelt," have a "built-in" softener which becomes an integral part of the finished leather.

The sulfonyl chlorides are particularly well adapted as tanning agents for white leather. This new process is currently applicable to white and colored glove leathers, furs, and some garment leathers, as well as chamois. Further work will be required before "Skelt" tanning agents can be used for shoes and other leather goods demanding a high degree of water resistance.

Because of their snowy whiteness, leathers tanned in this way can be dyed to unusually bright colors as well as pastel shades.

These new synthetic tanning agents are made by treating a petroleum oil with a gaseous mixture of sulfur dioxide and chlorine, using light of a suitable wave length as a catalyst to speed up the reaction. In contrast with scarce imported tanning agents, the new synthetic tans are based on readily available, low-cost domestic raw materials.

Although strong as leathers made by other methods of tanning, sulfonyl chloride tanned leathers are as soft as the finest chamois or doe. By this new process it is also possible to make leathers which feel warmer than those made by conventional tanning procedures.



READY TO START 6000 HORSES ON THEIR WAY

The signal to go . . . a touch of the throttle . . . and the big Diesel locomotive will glide smoothly away. But first, its three 2000-hp. engines must be cranked, just like the engine in your car. Dependable power, and plenty of it, is required . . . one reason why so many railroads use trustworthy Exide Batteries.

In other departments of railroad service, Exide Batteries supply power for passenger car lighting, air-conditioning, track and signal circuits, crossing lights, train telephones and numerous other tasks.

There are Exide Batteries for every storage battery need. They provide motive power for battery electric industrial trucks. They furnish safe, dependable power for mine locomotives and shuttlecars. They are used by radio stations, telephone and telegraph companies, central

stations . . . on ocean vessels and airplanes . . . in municipal fire alarm systems . . . in many other applications where dependability is vital. And on millions of cars, trucks and buses they give daily proof that "When it's an Exide, you start."

Information regarding the application of storage batteries for any business or industrial need is available upon request.

THE ELECTRIC STORAGE BATTERY CO.
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

Exide
BATTERIES

1888...Dependable Batteries for 60 Years...1948



...and we've been way out in front ever since!"

Time after time a survey by a Diebold Systems Man shows records are playing a costly "Ring-Around-A-Rosy" game all through the office. His systems-survey streamlines the operation . . . simplifies procedure, eliminates duplication of actions.

Is your record-handling system as efficient as it could be? Find out now. Have a Diebold Systems Man survey it at no cost to you. Because Diebold makes *all four* types of record handling equipment, a Diebold recommendation is *unbiased*, fair, best for you. Phone your local Diebold Office, or write
—Diebold, Inc., 1611 Fifth Street, S.W., Canton 2, Ohio.



Cycle Billing—so successful in modern department stores—sometimes fits other businesses with amazing savings in time and better customer relations. Get the story from your Diebold Man.

Diebold *Systems*
RECORD-HANDLING



MICROFILM • ROTARY, VERTICAL AND VISIBLE FILING EQUIPMENT • SAFES, CHESTS AND VAULT DOORS • BANK VAULT EQUIPMENT • BURGLAR ALARMS

PRODUCTION
EXECUTIVE

Office Equipment and Supplies

Monthly
FORMS FORUM

Purchase Order, Purchase Requisition, Quotation Request, Receiving
Slip, Cost Sheet, Inventory Sheet, and Credit and Debit
Memorandums used by Purchasing Department of
Troy Engine and Machine Company

The accompanying forms were furnished for use in the Forms Forum by G. W. Inman, Purchasing Agent of the Troy Engine & Machine Company, a small industrial operation of Troy Pennsylvania, whose products include vertical and horizontal steam engines, governors, and generators.

The set of forms, marked by simplicity, include purchase order, purchase requisition, quotation request, notice of change in purchase order, receiving slip, inventory record, cost sheet, purchase record,—withal, an assortment of interest to many companies.

The Purchase Requisition, designed for binder filing, is 8½" wide by 5½" deep, overall, and is prepared in duplicate by the requisitioning department. The form indicates the purpose or use for which the material is wanted, and when it is wanted.

The Purchase Order, also designed for binder filing is 11" x 11" in size, the order form, per se, being 8½" x 11". This form is made out in quadruplicate—white copy for the supplier, yellow copy for the purchasing department, blue copy for the receiving department, and orange copy for the accounting department. The latter two are on plain paper stock without printing of the form.

The purchase order form and the purchasing department's copy of the form are reproduced. On the latter, it will be noted, the format has been extended to include columns for invoicing and receiving information.

The rest of the forms are self-explanatory. The Quotation Request, printed on letter size stock, is prepared in duplicate. It bears the title "Quotation Request" and in large type thereunder emphasizes that "This is an Inquiry—Not an Order." It calls for specific information on prices, de-

(Please turn to page 228)

TROY ENGINE & MACHINE CO. Troy, Pennsylvania, U. S. A. <small>Manufacturers of</small> Steam Engines, Generators, Generating Sets <small>"Low cost by-product power"</small>		PURCHASE ORDER												
		No. 60163												
<p>To _____ Date _____</p> <p>Overall size, including binding, 11" x 11"</p> <p>Ship to us _____ Ship via _____</p> <p>Delivery _____ F. O. B. Cars _____</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">AMOUNT</th> <th style="width: 60%;">DESCRIPTION</th> <th style="width: 10%;">LIST PRICE</th> <th style="width: 10%;">DISC.</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p style="text-align: right;">TROY ENGINE & MACHINE CO.</p> <p>By _____ Purchasing Agent</p>			AMOUNT	DESCRIPTION	LIST PRICE	DISC.								
AMOUNT	DESCRIPTION	LIST PRICE	DISC.											

See Purchasing Department copy of Purchase Order on Following page

Purchase Requisition		No. _____
<small>FORM 8240 WORLD WIDE PRESS, CHICAGO</small>		
<small>TR-MCO.</small> Purchasing Department <small>Please purchase the following named items:</small>		
<small>Overall size, including binding, 8½" x 5½"</small> <small>INDICATE SOURCE OF SUPPLY IF KNOWN</small>		
Quantity	Number	Description
<small>Purpose or Use</small> <small>When wanted</small>		<small>To be filled in by Purchasing Dept.</small> <small>Date ordered _____ Order No. _____</small> <small>From _____</small>
<small>For _____</small> <small>Dept. _____</small>		<small>Approved _____</small>

(Forms Forum Continued from page 227)

TROY ENGINE & MACHINE CO. Troy, Pennsylvania, U. S. A. Manufacturers of Steam Engines, Generators, Generating Sets <i>"Low cost by-product power"</i>									
PURCHASE ORDER No. 60163									
To					Date				
Ship to us					Ship via				
Delivery					F. O. B. Cars				
INV'D	REC'D	AMOUNT	DESCRIPTION			LIST PRICE	DISC		

TROY ENGINE & MACHINE CO. Troy, Pennsylvania, U. S. A. Manufacturers of Steam Engines, Generators, Generating Sets <i>"Low cost by-product power"</i>										
Notice of Change in our PURCHASE ORDER No.										
Attach to our original order.										
To					Date					
8½" x 11"										
Ship to us					Ship via					
F. O. B. Cars										
AMOUNT	DESCRIPTION			DELIVERY TROY, PA.	LIST PRICE	DISC				
TROY ENGINE & MACHINE CO.										
By _____ Purchasing Agent										

The Notice of Change in Purchase Order is similar to the Purchase Order form. The words "Notice of Change" are printed in red. Notice of change is sent to the Receiving and Accounting Department.

1	TROY CO.	4											
2		5											
3	Overall size, including binding 10½" x 5"	6											
MATERIAL ORDERED													
ITEM	DATE	ORD. NO.	QUANTITY	ITEM	DATE	QUANTITY	PRICE	PER	DISCOUNT	AMT. INVOICE	FRT & EXP	UNIT COST	REMARKS
This form filed in large ring binders and information posted from purchase order and suppliers invoices.													
V JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC													
KIND OR SIZE MATERIAL													

COST SHEET		PART TROY CO			PART NO.					
MATERIAL Overall, including binding, 9½" x 6"										
DATE	MACHINE			BENCH			MATERIAL			TOTAL COST
	TIME	RATE	COST	TIME	RATE	COST	WEIGHT	RATE	COST	
This form used for cost of small assemblies and sub-assemblies making up our production.										

The Notice of Change in Purchase for recording the cost of small assemblies and sub-assemblies.

(Forms Forum Continued on Page 230)

AMERICA HAS COME A LONG WAY IN THE PAST FIFTY YEARS



"There She Goes, Boys!"

People took buggy rides for miles to see those daredevils actually leave the earth in that new-fangled contraption. Patiently they waited, every second packed with drama, until that breath-taking shout, "She's off the ground!" At a balloon ascension 50 years ago, even the spectators were up in the air!

Today passengers fly from coast to coast as matter-of-factly as Grandpa jogged to town. Air travel has grown from a stunt to a necessity. A development in which paper has played no small part. For example:

Take blueprints and specifications; tickets and timetables and flight reports; maps and travel folders; weather maps; and the periodicals reporting in aviation. Every one is a paper product—tailor-made to do its special job!

Ever since 1898, the year International Paper Company was established, paper has been the herald and servant of progress.

International Paper Company, 220 East 42nd Street, New York 17, N.Y.



INTERNATIONAL PAPERS

For Printing and Converting



TROY ENGINE & MACHINE CO. Troy, Pennsylvania, U. S. A. Manufacturers of Steam Engines, Generators, Generating Sets <i>"Low cost by-product power"</i>		
To _____	Date _____	
8 $\frac{1}{2}$ " x 11"		
Please Quote On The Following:		
Item No. _____	Quantity _____	Item and Specification
By _____		Purchasing Agent _____
TROY ENGINE & MACHINE CO.		

The Receiving Slip is a simple form printed on stock 6" x 9 $\frac{1}{4}$ ", on which receiving clerk notes number of items received with description thereof. Copy of Purchase order is furnished to the Receiving Department.

The Quotation Request form clearly indicates that it is an "Inquiry—Not an Order." It is printed on letter size sheet. It specifically states that information is required on prices, delivery, terms, shipping point, F.O.B. point, and estimated weight.

TE&MC		RECEIVING SLIP	
No. _____		19	
Received from _____ Actual size 6" x 9 $\frac{1}{4}$ "			
Via _____ Charges _____			
Memo. _____			
Articles	DESCRIPTION		

TROY ENGINE & MACHINE CO.	
STEAM ENGINES	
GENERATING SETS — GENERATORS	
TROY, PENNSYLVANIA	
Inv. Form 10M 2/1948	
	
CUSTOMER'S ORDER NO. & DATE	
REQUISITION NO.	
CONTRACT NO.	
SOLD TO	
Actual size 8 $\frac{1}{2}$ " x 11"	
SHIPPED TO AND DESTINATION	
DATE SHIPPED	
CAR. INITIALS AND NO. SHIPPED AND ROUTE	
TERMS	
QUANTITY	
DESCRIPTION	
UNIT PRICE	
AMOUNT	
REF. TO INVOICE NO.	
INVOICE DATE	
VENDOR'S NO.	
PREPAID OR COLLECT?	
FOR CUSTOMER'S USE ONLY PURCHASED NO. _____ VOUCHER NO. _____ F. O. B. CHECKED TERMS APPROVED _____ PRICE APPROVED _____ CALCULATIONS CHECKED _____ TRANSPORTATION FREIGHT BILL NO. _____ AMOUNT _____ MATERIAL INSPECTED ID _____ DATE _____ SIGNATURE _____ TITLE _____ SATISFACTORIES AND APPROVED REQUIREMENTS ACCOUNTING DISTRIBUTION AUDITED _____ FINAL APPROVAL _____	

Inventory Form. Purchased materials and supplies are inventoried at the end of each quarter.

Standard invoice form is used by the Troy Engine and Machine Company.

The various purchase order forms, it will be noted, indicate the company's line of manufacture.

Prod. #3		Troy Co		Actual size 8 $\frac{1}{2}$ " x 11"	
Item and Description		Unit of Measure		Date of Inventory	



More than 90% of all business units in the nation are "small business" establishments.

Small Business? Here, too, Moore cuts costs

Dry cleaner. Florist. Shoe merchant. Restaurant. Week after week, Moore helps small businesses cut overhead.

Billion-dollar corporations save thousands of man-hours by using Moore business forms. And even the "one-man" business cuts costs—because Moore offers *the right business form for every form of business*. A small Lexington, Kentucky, parts equipment company, for example, was using 4 separate forms, requiring 4 writings

for each customer order. Moore designed a 4-part continuous register form that completed all paper-work in one writing.

Your business can save too. Call your local Moore office, now. Moore sales offices in over 200 cities from coast to coast. Factories in Niagara Falls and Elmira, N. Y.; Minneapolis, Minn.; Denton, Tex.; Los Angeles and Emeryville, Calif. Also sales offices and factories across Canada.

MOORE 
BUSINESS FORMS
INC.

THE ONLY NATIONAL COMPANY THAT OFFERS A COMPLETE RANGE OF MODERN BUSINESS FORMS—

THE RIGHT BUSINESS FORM
FOR EVERY FORM OF BUSINESS!

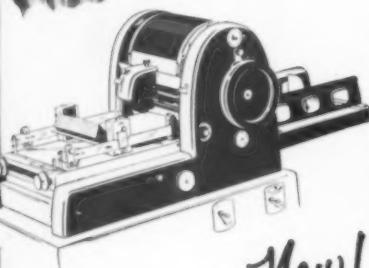




CLEAR CRISP COPIES

OPERATORS SAY, "THAT'S FOR ME"

QUICK
EASY



A. B. DICK "400" SERIES

MIMEOGRAPHS WITH

Flexamatic Control*

New duplicating ease and speed. Designed for flexible, positive control of paper, ink and copy. For use with all makes of suitable stencil duplicating products. See these new models at your nearest A. B. Dick branch or distributor—listed in the phone book—or write for information.

A. B. Dick Company,
720 West Jackson Boulevard,
Chicago 6, Illinois.
The Mimeograph Company, Ltd.;
Toronto, Canada.

A. B. DICK



"the oldest name
in mimeographing"

(Forms Forum Continued from page 230)

Form C.M. 1000 9/1947

CREDIT MEMORANDUM

Troy Engine & Machine Company

TROY, PENNSYLVANIA

Accounting No.

Actual size $8\frac{1}{2}'' \times 5\frac{1}{2}''$

Referring to

We to-day CREDIT your Account as follows:

DEBIT MEMORANDUM

TROY ENGINE & MACHINE COMPANY

TROY, PENNSYLVANIA

Accounting No.

Actual size $8\frac{1}{2}'' \times 5\frac{1}{2}''$

Referring to

We to-day CHARGE your Account as follows:

livery, terms, shipping point, FOB point, and estimated weight.

The "Notice of Change in our Purchase Order No. —" so indicates in red type. This form is made out in duplicate, and notice of the change is sent to the receiving and accounting departments so that record of the change can be posted on their respective copies of the original purchase order.

The cost sheet, reproduced, is used for

recording the cost of small assemblies and sub-assemblies. It is a small form, $9\frac{1}{2}'' \times 6''$, designed for binder use. The inventory form, on letter-size sheet, is a mimeographed form. At present purchased materials and supplies are inventoried at the end of each quarter. The installation of a complete cost system is currently being considered which it is expected will make for changes in the purchasing procedure and forms used.

Washington, D.C.: George Brennan is now in charge of the Mason-Dixon Line territory.

Cleveland: Edward A. O'Donnell has been named district representative succeeding George Witzel.

THREE-COLOR EFFECT WITH ONE-COLOR PRINTING

Three-color effect with one-color printing is now possible with the New "Double Deckle" line of printing papers announced by Strathmore Paper Company, West Springfield, Mass. Two color shades in a single sheet produce remarkable color contrasts by means of the simplest folds. At the same time the paper possesses the "expressive" qualities of color, surface and texture.

The paper is available in two weights and utilizes two tones of six muted colors . . . blue, yellow, tan, green, gray and rose. These colors have been carefully selected for most effective use by printers and advertisers. They are colors that are suitable for a wide variety of uses, art and typographical treatments and ink combinations.

Each weight has a different duplex combination of color shades. The lightweight papers have one side white, the other, a

(Please turn to page 234)

A WINNER...
ON EVERY COUNT

+

ADD

×

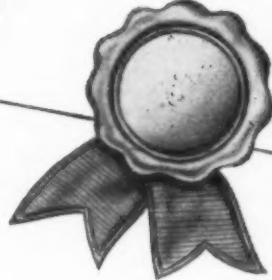
MULTIPLY

-

SUBTRACT

÷

DIVIDE



Neat, simple, and streamlined, this new Underwood Sundstrand Adding-figuring Machine combines high speed and accuracy with *versatility*.

Note, there are only 10 numeral keys. Yet, this Underwood Sundstrand machine will add, subtract, multiply, and divide.

Operators learn this tidy, compact keyboard in a matter of minutes. Their fingers develop a "touch method" that requires no prompting. Eyes are kept on work sheets. Tiring head swinging is thus eliminated, and work proceeds smoothly . . . without hesitancy or delay.

You'll like the quiet, easy action of this precision-built machine, too. Fingers ripple naturally over the keys . . . setting up numerals . . . producing accurate totals, sub-totals, and credit balances.

You'll also like the pleasing gray, non-glare finish of

*Count on this speedy, accurate
Underwood Sundstrand
for every figuring need.*

this Underwood Sundstrand. Still another feature is the new, accurate cutting-knife that enables you to zip off the tape without damaging your figures.

Find out more about the new Underwood Sundstrand Adding-figuring Machines. Made in sizes and capacities for every business. Call your Underwood Representative for a demonstration today.



© 1948

Underwood Corporation

Adding Machines . . . Accounting Machines . . . Typewriters . . .
Carbon Paper . . . Ribbons and other Supplies

One Park Avenue

New York 16, N. Y.

Underwood Limited, 135 Victoria Street, Toronto 1, Canada

Sales and Service Everywhere

(Continued from page 232)

pastel shade. The corresponding heavyweight papers match the lightweight color on one side, with a deeper shade of that color on the other side. Both weights have the contrasting double deckle feature . . . white in the pastel lightweight papers, the corresponding pastel in the heavyweight papers.

In addition to folding, further variations are possible by combining the two weights or different colors. Sheet size is a standard 26 x 40 inch with envelopes-to-match in the lightweight of all colors and white.

1 1 1

GENERAL FIREPROOFING ANNOUNCES NEW LINE OF DESKS

A new line of steel desks with aluminum trim, introducing an advanced conception of modern design and comprising 35 models, is announced by the General Fireproofing Co., Youngstown, Ohio.



Single pedestal type "Mode-Maker" with smooth sliding, ball suspension file-drawer coming off the production line.

Marketed as the "Mode-Maker", the desks are finished in GF gray. The line is flexible and because of standard pedestals, tops and legs, desks can be assembled at the point of use, if desired. A func-



The new executive "Mode-Maker", one of the 35 models.

tional advance is found in a new lock control mechanism in the center drawer which eliminates the necessity of pulling out the center drawer when opening the pedestal drawers. Anodized aluminum legs are available in two heights for desks either 29 inches or 30½ inches high, and may be quickly changed.

LOOKING FOR SOMETHING?
. . . PUT A "WANTED"
AD IN PURCHASING'S
CLASSIFIED SECTION PAGE 346

Levelcoat*

PRINTING PAPERS



Distributed by

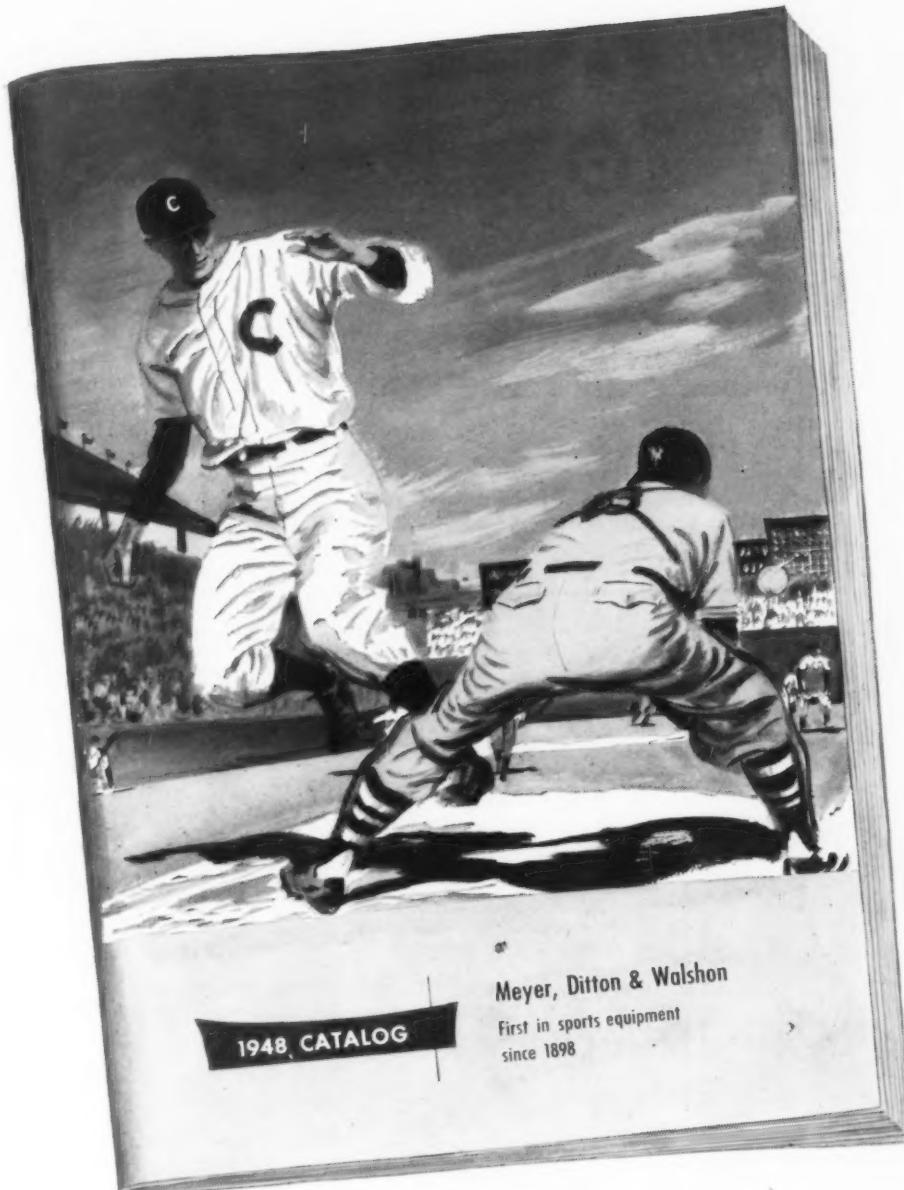
ALABAMA		
Birmingham	.....	Sloan Paper Company
ARIZONA		
Phoenix	.....	Zellerbach Paper Company
ARKANSAS		
Little Rock	.....	Arkansas Paper Company
CALIFORNIA		
Eureka	.....	Zellerbach Paper Company
Fresno	.....	Zellerbach Paper Company
Los Angeles	.....	Zellerbach Paper Company
Oakland	.....	Zellerbach Paper Company
Redding	.....	Zellerbach Paper Company
Sacramento	.....	Zellerbach Paper Company
San Diego	.....	Zellerbach Paper Company
San Francisco	.....	Zellerbach Paper Company
San Jose	.....	Zellerbach Paper Company
Stockton	.....	Zellerbach Paper Company
COLORADO		
Denver	.....	Carpenter Paper Company
Pueblo	.....	Carpenter Paper Company
CONNECTICUT		
Hartford	.....	The Rourke-Eno Paper Co., Inc.
West Haven	.....	Bulkey, Dunton & Co., Inc.
DISTRICT OF COLUMBIA		
Washington	.....	The Barton, Duer & Koch Paper Co.
FLORIDA		
Jacksonville	.....	Knight Brothers Paper Company
Miami	.....	Knight Brothers Paper Company
Orlando	.....	Knight Brothers Paper Company
Tallahassee	.....	Knight Brothers Paper Company
Tampa	.....	Knight Brothers Paper Company
GEORGIA		
Atlanta	.....	Sloan Paper Company
IDAHO		
Boise	.....	Zellerbach Paper Company
ILLINOIS		
Chicago	.....	Berkshire Papers, Inc.
Chicago	.....	Chicago Paper Company
Chicago	.....	Midland Paper Company
INDIANA		
Indianapolis	.....	Crescent Paper Company
IOWA		
Des Moines	.....	Carpenter Paper Company
Sioux City	.....	Carpenter Paper Company
KANSAS		
Topeka	.....	Carpenter Paper Company
Wichita	.....	Western Newspaper Union
KENTUCKY		
Louisville	.....	The Chatfield Paper Corp.
LOUISIANA		
Baton Rouge	.....	Louisiana Paper Co., Ltd.
New Orleans	.....	The D and W Paper Co.
Shreveport	.....	Louisiana Paper Co., Ltd.
MAINE		
Augusta	.....	Carter, Rice & Company Corp.
MARYLAND		
Baltimore	.....	Baltimore Paper Company, Inc.
MASSACHUSETTS		
Boston	.....	Carter, Rice & Company Corp.
Springfield	.....	Bulkey, Dunton & Co., Inc.
Worcester	.....	Charles A. Esty Paper Company
MICHIGAN		
Detroit	.....	Seaman-Patrick Paper Co.
Grand Rapids	.....	Carpenter Paper Company
MINNESOTA		
Minneapolis	.....	Carpenter Paper Company
St. Paul	.....	Carpenter Paper Company
MISSISSIPPI		
Jackson	.....	Jackson Paper Company
Meridian	.....	Newell Paper Company
MISSOURI		
Kansas City	.....	Carpenter Paper Company
St. Louis	.....	Beacon Paper Company
St. Louis	.....	Shaughnessy-Kniep-Hawe Paper Co.
St. Louis	.....	Tobey Fine Papers, Inc.
MONTANA		
Billings	.....	Carpenter Paper Company
Butte	.....	Carpenter Paper Company
Great Falls	.....	Carpenter Paper Company
Missoula	.....	Carpenter Paper Company
TEXAS		
Austin	.....	Carpenter Paper Company
Dallas	.....	Carpenter Paper Company
Fort Worth	.....	Carpenter Paper Company
Harlingen	.....	Carpenter Paper Company
Houston	.....	Carpenter Paper Company
Lubbock	.....	Carpenter Paper Company
San Antonio	.....	Carpenter Paper Company
UTAH		
Salt Lake City	.....	Zellerbach Paper Company
VIRGINIA		
Richmond	.....	Cauthorne Paper Company
WASHINGTON		
Seattle	.....	Zellerbach Paper Company
Spokane	.....	Zellerbach Paper Company
Tacoma	.....	Zellerbach Paper Company
Walla Walla	.....	Zellerbach Paper Company
Yakima	.....	Zellerbach Paper Company
WISCONSIN		
Milwaukee	.....	The Bouer Paper Company
EXPORT AGENTS		
American Paper Exports, Inc., New York, U. S. A.		
Cable Address: APEXINC—New York		

NEENAH, WISCONSIN
8 South Michigan Avenue, CHICAGO 3
22 Marietta Street, N. W., ATLANTA 3

*TM. Reg. U. S. Pat. Off.

Before choosing any printing paper . . .

Look at Levelcoat*



Illustrated here is a typical use of Levelcoat*, not an actual booklet

IT PAYS TO LOOK AT LEVELCOAT



Levelcoat* printing papers are made in these grades: Trufect*, Kimfect*, Multifect* and Rotofect*.

KIMBERLY-CLARK CORPORATION, NEENAH, WISCONSIN

*T. M. REG. U. S. PAT. OFF.

LETTERING INSTRUMENT

New lettering instrument which makes many sizes of letters from one templet, is announced by the Varigraph Company, Inc., Lincoln 3, Nebr. The letters may be reproduced to any desired width combined with any desired height between .075 and .750 of an inch. Letter width and letter



Letters may be reproduced to any desired width with any desired height between .075 and .750 of an inch.

height are controlled by positioning two knobs. The Varigraph slides against any straightedge in moving from one letter position to the next. A lettering templet carried by the instrument slides left and right to position in the instrument to the desired letter, and to reproduce a letter a finger operated point follows the letter grooves in the lettering templet.

The instrument can be used with equal ease by either right or left handed persons,

and the manufacturer claims a saving of as much as 90% of the time required for hand lettering. Also, the makers state it is the first mechanical device developed which will reproduce a copied figure without distortion at variable height-width ratios.

"A" grade for the first time since the war. Also available are four new pamphlets entitled: "7 Answers to Your Storage Problems"; "Berger Steel Filing Equipment"; "Berger Steel Transfer Cases"; and, "Berger Bookshelf Units", all in color.

NEW STAPLE REMOVER AND LETTER OPENER

A new staple remover, based on natural movements and having no hinges, jaws or gadgets, has been announced by The E. H. Hotchkiss Company, Norwalk, Conn. It has a slim, highly polished stainless steel blade, 5" long, with gradually rising sides. Handles are made of plastic in red, black, green or ivory.

The tip of the blade is slipped under the crown of any standard staple and is slid forward. The staple is opened and removed without tearing the paper. The instrument can also be used as a letter opener.

CATALOG ON STEEL OFFICE EQUIPMENT

Announcement is made by the Berger Manufacturing Division, Republic Steel Corporation, Canton, Ohio, that its standard steel office equipment catalog has been revised, and that the company is now offering a complete line of equipment of the

WALNUT WOOD DESK ANNOUNCED BY MASO



A new streamlined, compact walnut wood desk, single pedestal, is being introduced by Maso Steel Products, 500 So. Throop St., Chicago 7, Ill. The desk features genuine walnut veneer for the top, panels and drawer fronts; dovetailed drawers; all surfaces hand rubbed; and ample leg room. The desk is 36" long, 24" wide, and 30" high.

(Please turn to page 238)

"ONE-STOP" HEADQUARTERS

Whether you want to modernize a small office or equip a big plant, you'll find American Commercial Equipment Co. the most satisfying place to buy office furniture needs. We carry America's most famous brands . . . offer you the widest possible scope of selection in desks, chairs, files, leather furniture, safes, steel shelving, etc. You'll be delighted, too, with our quick, efficient, courteous service. Write for our latest brochure or phone for further information.



AMERICAN COMMERCIAL EQUIPMENT CO.

OFFICE FURNITURE AND EQUIPMENT
EAST ORANGE, N. J. NEW BRUNSWICK, N. J.
396 Main St. • 112 Church St.
Orange 2-9500 • Charter 7-1500

A NEW Hotchkiss Automatic TACKER



THE NEW MODEL 96 TACKER



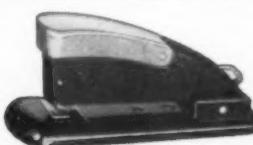
Light, durable, all-steel construction.

Uses four different sizes of staples.

Hotchkiss automatic tackers have served shippers for over a generation.

Send for circular.

HOTCHKISS
makes a complete line
of desk and plier
type paper fasteners.



THE E. H. *Hotchkiss* COMPANY
NORWALK CONNECTICUT
"Pioneers in all that's best in stapling"

whether you **USE**
a thousand forms a year
or a million,
save time!
trouble!
money!
*with **UARCO** business forms*

save time! With Uarco business forms, one writing produces every copy the job requires, and frequently several jobs can be combined.

save trouble! No recopying . . . mistakes are fewer.

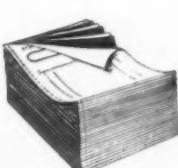
save money! From start to finish—writing, distributing, checking, filing—waste motion is eliminated; *you don't pay for a single unnecessary move!*

These savings apply to any business, no matter what size, no matter what kind. To see how they apply to *your* business, you have only to call your Uarco Representative. He will make a complete survey and recommend needed improvements with no obligation and at no cost whatever.

UARCO INCORPORATED

Chicago, Ill.; Cleveland, Ohio; Oakland, Calif.; Deep River, Conn.
Offices in All Principal Cities.

for instance . . . here's real efficiency! Uarco Multi-Fold Continuous Forms feed the typewriter continuously. No carbon shuffling for the typist. The great variety of Uarco business forms brings this and many other efficiencies to any kind of business operation.



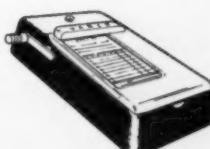
CONTINUOUS-STRIP FORMS
FOR TYPEWRITTEN AND BUSINESS MACHINE RECORDS



BUSINESS FORMS



SINGLE SET FORMS



AUTOGRAPHIC REGISTERS
AND REGISTER FORMS



THIN PAPERS
Reduce
 TYPING, MAILING
 and FILING COSTS
Use
ESLEEK
 THIN PAPERS

Fidelity Onion Skin
Clearcopy Onion Skin
Superior Manifold

Esleek Manufacturing Co.
 Turners Falls, Mass.

Oxford **PENDAFLEX**
 HANGING FOLDERS



Yes, your file clerks will need only half the time—and will do a better job—with new style PENDAFLEX hanging folders. Send coupon now for catalog and name of nearby dealer who will install trial drawer. Money back if not satisfied.

OXFORD FILING SUPPLY CO., INC.
 Garden City, N. Y.
 Send Pendaflex catalog and name of dealer to:
 NAME _____
 ADDRESS _____
 CITY _____ ZONE _____ STATE _____

**BOTH HANDS FREE
 WHEN TELEPHONING**

Both hands free when telephoning! That is the advantage offered by new telephone aid named the Tel-O-Aid, announced by the Wagner-Metcalf Co., 220 West Broad-



way, Glendale, Calif. The unit is illustrated. When the 'phone rings, don't touch it—just flip a switch and hold normal conversation with both hands free. The unit has no mechanical connections to the telephone, yet it eliminates lifting the receiver for conversation. Installation is merely a matter of plugging into the nearest socket.

The maker claims that the Tel-O-Aid is excellent for conference work because it keeps conversation to a minimum. Both the incoming and outgoing voice are clearly audible in normal tones from any point in the room. It can be used for interoffice communications, or detached at will for private conversation by lifting the receiver. For outgoing calls, dial as usual.

**NEW READER INCREASES
 EFFICIENCY OF MICROFILMING**

New type of motor driven microfilm reader, known as the Film-a-record Reader-Desk, is announced by the Photo Records Division of Remington, Rand, Inc., 315 Fourth Avenue, New York, N. Y. Tests show that an experienced operator can load it and locate any image on a 100-ft.



The screen enlarges documents 23 diameters to original size or larger.

roll of indexed film in less than 60 seconds without leaving her chair. Film can travel in either direction as fast as 150 ft. per minute, and instantly be brought to a full stop by a knob control. The Reader-Desk keeps images in constant focus at all readable speeds. A 14" x 14" screen enlarges documents 23 diameters to original size or larger. The desk provides ample leg room for the operator and contains a convenient utility drawer.

Overall dimensions of the desk are 36" wide x 21½" high by 27" deep. Folder entitled "From Film Box to Screen in 60 Seconds" describes the desk in detail.

(Please turn to page 240)

THOS. J. MORAN'S Sons



SEVEN FOURTEEN GIROD STREET
 NEW ORLEANS 13, LA.

offer you
SAVINGS
UP TO **40%**
 on **Office Supplies**

A PROCUREMENT PLAN

Designed to fit the needs of every Purchasing Agent—from the very largest to the smallest firm.

THREE EXCLUSIVE FEATURES

- 1. Small Minimum Quantities**
- 2. F.O.B. Your Office**
- 3. Prices Based on Dollar Value**

We take pleasure in introducing through this medium a simplified and economical plan, limited, for the present, to those firms requiring delivery in the following 18 States:

Alabama	Missouri
Arkansas	North Carolina
Florida	Ohio
Georgia	Oklahoma
Illinois	South Carolina
Indiana	Tennessee
Kentucky	Texas
Louisiana	Virginia
Mississippi	West Virginia

THOS. J. MORAN'S SONS
 Seven Fourteen Girod Street
 New Orleans 13, La.

Please send me a copy of your 44 page illustrated catalogue.

Name of Firm _____

Mr., Mrs., Miss _____

Address _____

City _____

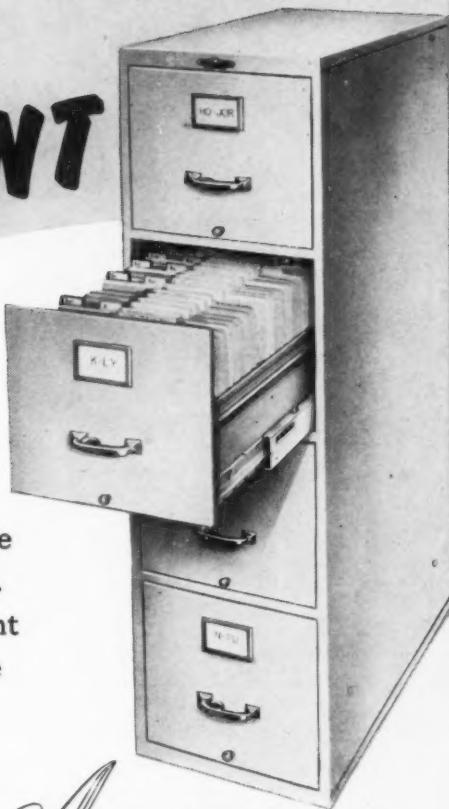
State _____

Buy *Filing Cabinets* as you would a

GOOD INVESTMENT



When you buy a steel file, you make an investment in storage space and operating convenience. Your "return" on this investment depends on the care you exercise in your selection. Remington Rand suggests these four rules for getting extra value for your money.



Aristocrat

BUY ON FITNESS

When you buy steel files, you're best served by the brand that offers you *complete line* choice. Aristocrat comes in 2-drawer desk height, space-saving 5-drawer height, 3-drawer counter height and 4-drawer standard height—a complete range for all sizes of paper and card records. You also want modern, beautiful styling. Aristocrat is finished in Gray-Rite—a decorative gray that blends with other office colors and reflects light without glare.

BUY ON STRENGTH

Aristocrat's extra-sturdy frame is welded into one rigid unit—no worries about any part of the file warping out of alignment. Carries far greater loads than the ordinary file is designed to hold.

To get details on the Aristocrat line of superior steel files, call our office near you for Booklet LB 356, "The Mark of Quality and Distinction in Steel Files"—or write Systems Division, 315 Fourth Ave., New York 10.

BUY ON PERFORMANCE

Performance—ease of operation—is tops in importance. The Remington Rand Aristocrat's drawer suspension has ball bearing and floating rollers so arranged that friction is practically eliminated. Even under a heavy load, there's no jamming, no annoyance, no slow-up of work—the drawers glide in and out at the touch of a finger.

BUY ON YIELD

Long wear is the real payoff in file value—the difference between a poor buy and a smart investment. Already at the top, Aristocrat is constantly being tested for improvements, in our customers' offices and in our own engineering laboratories—to make sure you get many extra years of satisfying service.



THE FIRST NAME IN BUSINESS SYSTEMS

Remington Rand

Copyright 1948—Remington Rand Inc.

FREE OFFER

for
Purchasing
Agents



As a rule, Purchasing Agents are not "coupon clippers" . . . neither is it our policy to send samples, but . . .

A.W. FABER-CASTELL

ERASERSTIK

A.W. FABER STIK (ALL SERVICE) U.S.A. 7099B

is so important to the efficiency of your typists, clerks, bookkeepers and executives, that we will gladly send you one of our wood-encased eraser beauties so you can test it for every erasing need—pencil, ink or typewriting.

EraserStik is the modern way to erase. Sharpen it with knife or mechanical sharpener and in seconds you have fresh, clean eraser stock. EraserStik gets into tight places, erasing one letter of a word without smearing surrounding area. Fewer letters need re-typing when EraserStik is used. Write today for free sample.

7099 without brush **10c**

7099B with brush . . . **15c**

a trifling cost for greater office efficiency.

**THE FIRST, THE ORIGINAL,
THE GENUINE
WOOD-ENCASED ERASER.**

A.W. FABER-CASTELL
PENCIL COMPANY INC., NEWARK 4, N.J.

1948 WITHHOLDING TAX COMPUTER

The 1948 Victor Recordex Withholding Tax Computer is announced by the Victor Safe and Equipment Co., Inc., North Tonawanda, N. Y. The computer includes all of the five payroll periods in one unit.



The Victor Withholding Tax Computer

All wage amounts show in the visible margins, providing instantaneous reference. It is stated that the unit will enable a payroll department to complete its work more quickly and easily than can be done using the standard tax tables.

1 1 1

DICK OFFERS NEW LINE OF STENCIL DUPLICATORS

A postwar line of stencil duplicators is being introduced by A. B. Dick Company of Chicago. The maker states the new duplicators are distinguished by their increased speed (up to 180 sheets per minute); faster over-all operation, and more exacting duplication. The new series consists of five models—410, 420, 430, 440 and



Model 430 of the A. B. Dick "400" line of mimeographs

450. The most important feature of the line's improvements is the "Flexamatic" control of paper, ink and copy during the mimeographing process. The heart of this control is the company's roll-type paper feed which is built to handle a wider range of weights, finishes and sizes of paper and with more speed than ever before. Top of the new series is the model 450, a heavy-duty electrically operated mimeograph for sustained high-speed operation. The 440 is either hand or electrically operated, and the 410, 420, and 430 are hand operated units.

(Please turn to page 243)

Where to get

**NEW ITEMS—
NEW SOURCES
OF SUPPLY...
quick**



A specialized buying directory designed and built for production, purchasing and engineering executives—to assist them, in the easiest manner, to secure sources of supply for all equipment, products or supplies used by industry.

Compact, complete and yet easy to handle—that's **PLANT PURCHASING DIRECTORY**.

Five separate sections make up this directory—A **CLASSIFIED SECTION**, containing the names and addresses of manufacturers classified by product—A **TRADE NAME SECTION**, listing alphabetically the trade name of the product with name and address of the manufacturer—An **ADDRESS SECTION**, giving the names and addresses of American manufacturers—A **CHEMICAL SECTION**, listing by product the name and address of important manufacturers—A **MECHANICAL DATA SECTION**, giving 34 pages of helpful tables, formulas, etc.

Use **PLANT PURCHASING DIRECTORY**! You'll really like it.

If by chance you haven't a copy, write us. We want every industrial buyer to have the benefits of this handy purchasing reference.

Incidentally, mentioning **PLANT PURCHASING DIRECTORY**, when sending out inquiries, means much in helping to increase our service to you.

*Reach for →
Keep it Handy ↗*

**PLANT
PURCHASING
DIRECTORY**

333 N. Michigan Ave., Chicago 1, Ill.
A Conover-Mast Publication

PURCHASING



How COLOR cuts the distance between two points

How MANY DAYS between the arrival of the order and its shipment from your plant? It is this time-distance that color can shorten.

Color does it by stepping up the pace of paper work—by adding a margin of speed and efficiency to the office and factory forms that control all phases of procurement,

production, accounting, and shipment.

HOWARD BOND's twelve clear, distinctive colors are proving this in countless offices and factories. Contrasting colors speed identification, minimize error, simplify handling and filing. And HOWARD BOND has the surface characteristics that make paper work flow smoothly through

preparation — plus the strength to withstand abuse in use.

HOWARD BOND is available through your printer or any of a national list of distributors. See it — in whitest white and colors. Test it by your own severe standards. Then, for forms, letterheads — wherever good bond is good business — specify HOWARD BOND.

HOWARD PAPER MILLS, INC. • HOWARD PAPER COMPANY DIVISION, URBANA, OHIO

Howard Bond

"THE NATION'S BUSINESS PAPER"





UNIFORMITY . . . Sales results are once again the measure of printed advertising and good printing is more important than ever. Without it, messages suffer, and so do carefully budgeted advertising dollars. For this reason, MAXWELL OFFSET—and the uniform printing qualities its users have come to expect—is first choice more and more often. This earned confidence is the reason why some of the finest advertising printing in America appears on MAXWELL OFFSET.

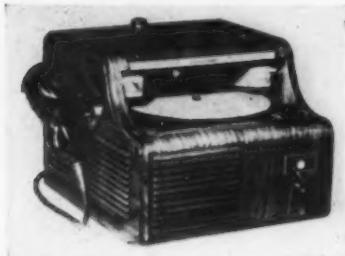
HOWARD PAPER MILLS, INC. • MAXWELL PAPER COMPANY DIVISION, FRANKLIN, OHIO

Maxwell Offset

For uniformity—in finish, in ink consumption, in whiteness or color conformity

SOUNDSCRIBER DUPLICATES VOICE RECORDING

Duplicating of voice recording is now brought into everyday use at the business desk by means of a new "DISCopying" unit, recently introduced by The Sound-Scriber Corporation, New Haven, Conn. The unit permits the copying of dictated or recorded material from one plastic disc

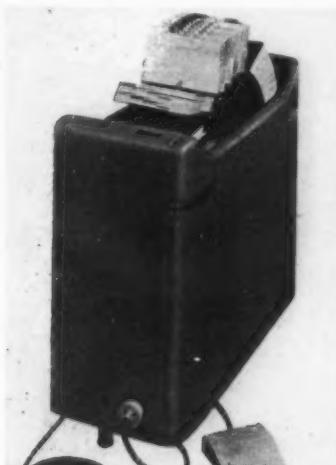


Extra disc copies of instructions, messages, telephone conversations, etc., are made on the same unit that recorded the matter originally.

to another automatically. Thus an executive may duplicate messages to field personnel or others, keep a "discopy" for his file and route the original and other copies wherever required. Copies of telephone recordings may be made as needed for department heads and other personnel concerned. The copies are made on the same unit that recorded the matter originally.

ROTARY CARD FILE ALSO MADE IN MOTORIZED UNIT

Announcement is made by Diebold, Inc., Canton 2, Ohio, that the Master Cardineer, its rotary card file, is now being manufactured in a motorized as well as hand unit.



Control is instant and automatic. At the touch of a hand button or foot pedal the records are revolved in either direction, presenting the desired record for posting, reference, removal or replacement, at desk top height and within arm's reach. One Master Cardineer houses up to 11,000 records in but three square feet of floor space. The units are mobile and one operator can handle as many as eight from a comfortably seated position. Three sides of the records are always fully exposed, giving the operator complete visibility of the entire face without removing it.



What every P.A. should know

Any secretary will be glad to tell you that all carbon papers are not alike. Webster's Micrometric, for example, is the only carbon paper with the numbered scale that warns typists when they approach the bottom of a page . . . assures neater spacing of letters and reports . . . results in faster work . . . helps secretaries avoid smudged fingers from carbon backs.

Yet Micrometric costs no more than any other quality carbon paper.

Factory warehouses from coast to coast mean quick delivery of Micrometric and other Webster products to over 1500 dealers — and to you. So order "Webster's" the next time you want carbon paper or typewriter ribbons; duplicating carbon papers and accessories, carbon paper ribbons for photo-offset work; ribbons and carbons for Elliott-Fisher, Addressing, Adding and International Business Machines. Consult your nearest dealer, or write to F. S. Webster Company, 7 Amherst Street, Cambridge 42, Mass. Warehouses in New York, Philadelphia, Pittsburgh, Detroit, Chicago, San Francisco.

Better Buy . . .

WEBSTER'S

**Micrometric Carbon Papers
and Typewriter Ribbons**

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Dictate while you travel

... and return to a clear desk!

Here is a profitable tip for your next business trip . . . take along a **SOUNDSCRIBER** Portable the very next time you head for the field. This silent, dutiful "secretary" is ready . . . day or night, and week-ends, too . . . to take down your thoughts . . . speed facts from the firing-line direct to your office or factory . . . giving you an accurate, up-to-the-minute report of your relations with customers and prospects.

Get the jump on competition! Dictate reports, memos, instructions,

letters . . . on the train, in your hotel room, or your automobile . . . *while the facts are fresh.*

SOUNDSCRIBER Portables convert travel-time into profit . . . keep work from piling up back at the office . . . speed your field work . . . increase calls, multiply profit opportunities.

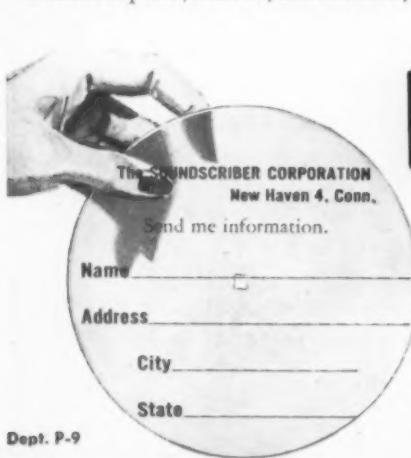
Produce more profits with this revolutionary business tool which, incidentally, is the *only complete, self-contained* dictation unit, and a truly handsome piece of business luggage besides. Mail coupon now!



SoundScriber discs hold up to 30 minutes of dictation—*are easily indexed, routed, filed or mailed.* Radio-clear quality insures accurate transcription. Low first cost, lower operating cost.

SOUNDSCRIBER
Trade Mark
ELECTRONIC DICTATING AND RECORDING EQUIPMENT

To find out how SoundScriber applies to *your* business, phone the nearest distributor, listed under "SoundScriber" in your classified telephone directory. Or mail the coupon.

	
THE SOUNDSCRIBER CORPORATION New Haven 4, Conn.	
Send me information.	
Name	<input type="text"/>
Address	<input type="text"/>
City	<input type="text"/>
State	<input type="text"/>
Dept. P-9	

SPECIAL CHAIR FOR WEIGHTY JUSTICE OF THE PEACE

W. B. Ward, justice of the peace Abilene, Tex., who weighs 465 pounds, recently was the recipient of an unusual chair made by the Murphy Chair Co. of Owensboro, Ky., which is big enough



and strong enough to enable him to adjudicate with dignity and safety. The chair is made of tough pecan wood, and the wood seat is almost four inches thick—as against the regular $1\frac{1}{8}$ inches. Its various parts are held together by carriage bolts, and it is fitted with a special swivel mechanism and double piano castors.



LOUVERED LIGHTING SYSTEM FOR DAYLIGHT EFFECT INDOORS

Translucent louvers hung side-to-side in geometric arrangements and giving the effect of daylight are the basis of the "Sky-Glo" lighting system offered by Benjamin



Louvers provide daylight effect

Electric Manufacturing Company, Des Plaines, Ill. The louvers are a standard unit system of vertical interlocked self-welded strips made of a special vinylite formula.

The units provide shadow-free light and at the same time completely conceal the light sources and the fixtures. The louvers do not alter the color of the light, are acoustically neutral and will not distort under prevailing room temperatures. They do not collect dust and grime.

(Please turn to page 246)

4-Second Loading



Precision engineered, sturdy Swingline

stapler . . . with its exclusive wide open channel for

quick, easy loading and trouble-free action . . .

SAVES TIME AND TEMPERS!

Swingline stapler and staples make the

speediest, smoothest-acting stapling team

in any office, factory, home or school!

Swingline
STAPLERS AND STAPLES

IT STAPLES . . . IT TACKS . . . IT PINS

SPEED PRODUCTS COMPANY, INC., LONG ISLAND CITY 1, N. Y.

SWINGLINE STAPLES

100% round wire for greater strength and penetration. Requires less glue, insuring perfect clog-free performance. Look for them in the red and blue box at your stationer's.

NOW!

Save Time -- Save Money

With

SnapEasy

ONE-TIME CARBON INTERLEAVED FORMS

Consolidate your various forms for one typing! Use of Snapeeasy one-time carbon interleaved forms saves typists' time, eliminates error, simplifies by standardizing, insures legibility, and speeds up office routine. We willingly adapt Snapeeasy forms to your own needs. No "minimum order" is necessary. Send us your forms for advice and an estimate — today!

- EFFICIENT
- ECONOMICAL
- PROMPT DELIVERY

Write Dept. P-1



The ARTHUR J. GAVRIN PRESS, Inc.

50 WEBSTER AVENUE • NEW ROCHELLE, N. Y.

**SCENERY BOOSTS
THE "BOX-OFFICE"**



Ever notice how top-notch scenery makes a "boy-meets-girl" movie seem better than usual? . . . Paper does the same for your direct mail story. That's a good reason why we suggest the best. See your printer. He's an expert. He'll help you select the right *Rising Intralace* for your next mailing.

Rising Intralace

- ✓ New brilliant white
- ✓ Inexpensive
- ✓ 5 weights
- ✓ Distinctive pattern appearance
- ✓ Envelopes to match in 5 sizes
- ✓ Specially sized for offset and gravure
- Excellent printing surface for letterpress

WHEN YOU WANT TO KNOW... GO TO AN EXPERT!

*Rising
Papers*

Rising Papers

ASK YOUR PRINTER... HE KNOWS PAPER!

Rising Paper Company, Housatonic, Mass.

**COPYHOLDER ADJUSTABLE
TO ALL TYPES OF WORK**

Versatile typing aid that holds all kinds of copywork in an easy-to-see position has been introduced by Copy Right Mfg. Corporation, 53 Park Place, New York 7, N. Y.



Holds all kinds of papers

All steel, the device has an easily adjustable metal blade which points out the exact reading place and keeps papers from blowing. Small in size, the unit can hold wide accounting sheets and long legal documents as well as papers and short-hand books. Spring tension grips hold papers and work sheets firmly in place. Metal shelf at bottom acts as a rest for heavy books. The unit can be folded flat for slipping into desk drawer or briefcase. Rubber bumpers on base and back prevent scratching desks.

1 1 1

**ADJUSTABLE ALUMINUM
STENOGRAPHIC CHAIR**

"Rest-All" stenographic chair illustrated above is made of aluminum, and features ball-bearing joints which connect the upholstered, self-adjusting backrest to



the frame. Continuous pressure and motion will not wear out the new connections, according to the manufacturer, Ohio Chair Co., Inc., Girard, O.

The seat and back are cushioned with 1" foam rubber, upholstered in green, brown, maroon or grey plastic-finish, simulated leather. The cast aluminum base is massive in appearance, has a natural, satin finish, and rides on ballbearing casters with soft rubber wheels. Full, five-point adjustability permits the maximum of individual posture fitting.

(Please turn to page 248)

UNDERWOOD CORPORATION

Finger-proof, Stainless

HECTOGRAPH

CARBON*

takes the "heck" out of
hectographing



Underwood Corporation's new Finger-proof, Stainless Hectograph Carbon takes hectographing forever out of the "messy job" category — rules out all employee reluctance to operating hectographing machines. In addition to being stain-proof and smudge-proof, this improved Hectograph Carbon offers other important refinements:

- Sharper Masters
- Greater quantity of reproductions
- Not affected by summer temperatures or high humidities
- Moisture-resistant
- No typewriter feed roll smudge on the Masters
- Uniformity as to intensity of type characters



- No more stained hands and clothing.
- No more special soaps and cleaners.

Make a note to try it,
next time you order.

Samples and prices are
now available at all
Branch Offices, or write
directly to us.

*Patent applied for

UNDERWOOD CORPORATION • Burlington, New Jersey



**RIBBONS
CARBONS
Duplicating
Supplies**

*For those
who prefer the best*

BROOKLYN 17, N. Y.

**VIBRATION MOUNTS
FOR OFFICE MACHINES**

Machine wear, employee fatigue and inefficiency caused by vibration and noise are said to be virtually eliminated by a new type K & S vibration mount for office machines. The manufacturer is Keating & Schorb, 92 Liberty St., New York 6, N. Y.

Mounts are designed for specific machines. Employing the principle of "floating power", the machine "floats" on a steel channel suspended in rubber between two angles. Units are furnished drilled and tapped, or with "cups" for feet which are not drilled. Mounts can be furnished with castors for machines which have to be moved.

**WIRE RECORDER WITH
HIGH FIDELITY**

Fidelity which is claimed to surpass that of acetate disc recording and a built-in radio and phonograph are among the features of the Wiremaster a new wire recorder produced by Precision Audio Products, Inc., 1133 Broadway, New York 10, N. Y.

The machine has 13 tubes, and records and reproduces a frequency response of 40-10,000 cycles, twice the usual response of wire recorders, and plays through a Jensen High Fidelity 8" PM speaker, housed in a separate cabinet to avoid vibration and acoustical feedback. All controls are located on the front panel, plainly marked.

A speaker monitoring control enables the user to adjust the listening volume to his own liking when recording, without affecting the recording volume.

**BALANCED-POSITION, TUBULAR
STEEL MAILBAG HOLDER**

A streamlined, balanced-position mailbag holder has been introduced by Commercial Controls Corp., Rochester 2, N. Y.



Holder fits any mailbag.

Made of tubular steel for maximum strength with minimum weight, the holder is adjustable in height from 36" to 40", fitting any size mailbag. A free-swinging bracket holds the bag open at a convenient angle so that mail can be tossed, thrown or dropped into it. It may be moved easily, even when the mailbag is full.

(Please turn to page 250)



Here is a new edition of our well known booklet...of special interest to those of your customers contemplating the purchase of a diamond.

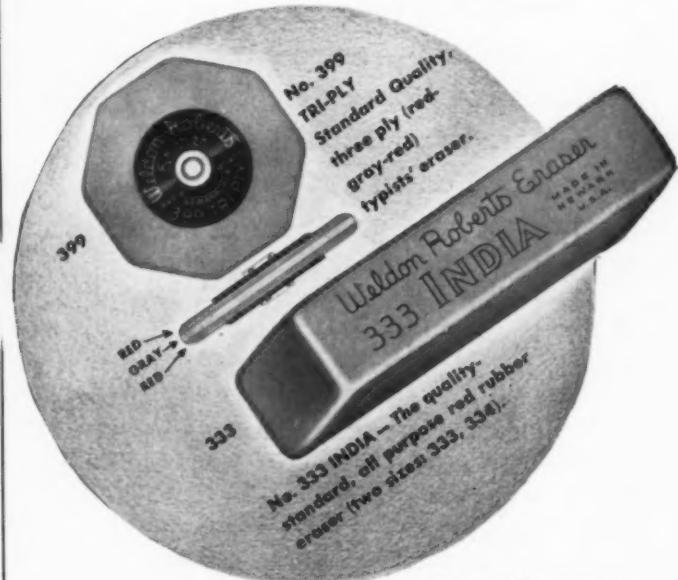
Sent on request...Address Department D

L. & C. MAYERS CO.

Diamond Merchants since 1912

545 FIFTH AVENUE, NEW YORK 17, N.Y.

Weldon Roberts Erasers
*They Correct Mistakes
in Any Language*



Two all-purpose
quality erasers.

WORLD'S QUALITY STANDARD

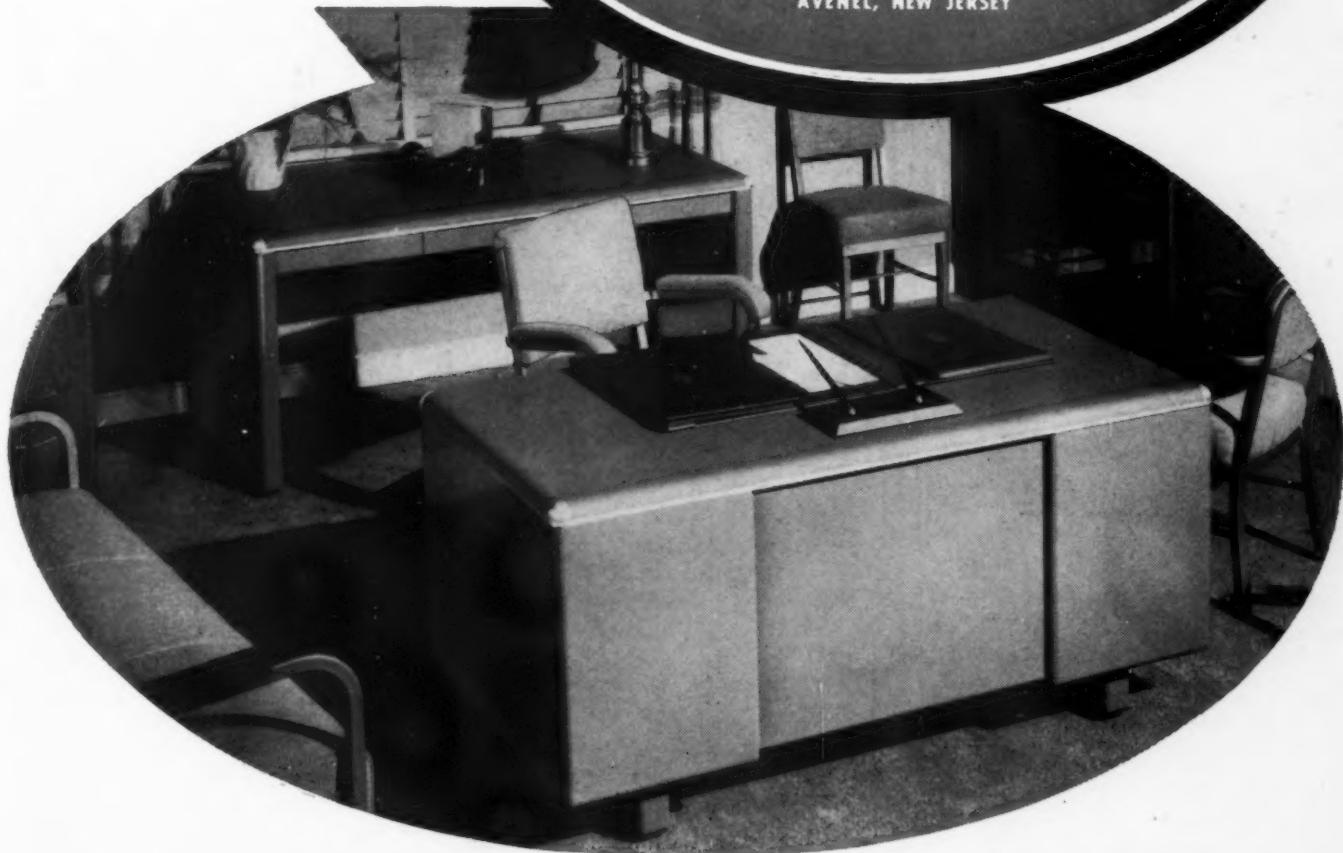
WELDON ROBERTS RUBBER COMPANY
Newark 7, New Jersey

On Fine Office Furniture The CrestLINE Label

Fine office furniture, designed for today and many tomorrows, is yours when you buy equipment bearing the *CRESTLINE* Label.

CRESTLINE is the brand name of an entirely new line of better office furniture. It is a name backed by equipment of fine appearance and unmatched efficiency plus the long life of full steel construction.

For an individual unit or a complete office installation . . . look first to the finest . . . to Security's *CRESTLINE*.



SECURITY STEEL EQUIPMENT CORPORATION, AVENEL, NEW JERSEY

MacRae's Blue Book

The Complete Buying Guide for Every Industrial Product — All in ONE BOOK

MacRAE'S BLUE BOOK is handy — efficient — accurate — more accessible — more manageable. Over 75,000 copies are in constant use every day.

56th edition closing. For advertising rates call your agency or write to MacRAE'S BLUE BOOK Co. 18 E. Huron Street, Chicago 11, Ill.

ST. REGIS ANNOUNCES RECENT APPOINTMENTS

George P. Haberstein has been named eastern sales manager of the St. Regis Sales Corporation, subsidiary of St. Regis Paper Company, and Logan G. Hill has been appointed eastern sales manager of



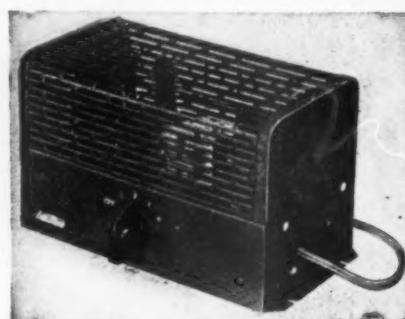
George P. Haberstein, Eastern Sales Manager St. Regis Sales Corporation.

the Multiwall Bag Division of the Company. Mr. Haberstein became associated with St. Regis late in 1947 as assistant manager of the advertising, publicity and sales promotion department.

1 1 1

INTERCOM AMPLIFIER FOR USE IN NOISY LOCATIONS

To provide audible communication in very noisy locations, such as machine shops, press rooms, etc., Executone, Inc.,



415 Lexington Ave., New York, N. Y., has announced a booster amplifier for use with their intercommunication and sound systems.

Designated Model P-29, it provides increased volume on systems designed to call or page all stations simultaneously. When used with an existing sound or intercom system, audibility of staff stations and reproducers located in large and noisy departments is substantially increased. It may be coupled with a standard Executone reply station.

1 1 1

"JUMBO" AIR MAIL

The "Jumbo" air mail envelope, carrying the red, white and blue parallelogram border, is announced by The Standard Envelope Manufacturing Company, 1600 E. 30th Street, Cleveland 14, Ohio. The envelope is made of a strong white kraft paper, tinted inside for opacity, in the 9 1/2" x 12 1/2" size. Samples will be furnished on request.

Every EXECUTIVE SHOULD HAVE THIS FREE BOOKLET



TELLS HOW TO INCREASE CONFIDENCE AND POISE

• HOW TO BUILD YOUR BODY AS YOU SIT

MAIL COUPON

A valuable daily guide for busy office executives. Important, helpful suggestions and information for daily use and reference by men who are interested in their "Physical Fitness and Personal Appearance." Write for this free book. No obligation.

DOMORE CHAIR COMPANY, INC.
Dept. 912, Elkhart, Indiana

Send the new, FREE booklet, "Physical Fitness and Personal Appearance" . . . at no obligation.

Name _____

Address _____

City _____ Zone _____ State _____

Company _____ Title _____

You get permanent and maximum transparency, when you use U.S.E. Mono-Outlook Window Envelopes

UNITED STATES ENVELOPE COMPANY
21 CYPRESS STREET SPRINGFIELD, MASS.



Not a patch! Window and envelope all one piece!

UNITED STATES ENVELOPE CO.

Springfield 2, Mass.

13 MANUFACTURING DIVISIONS
LOCATED FROM COAST TO COAST

See your Printer or Paper Merchant

Four word buying hint

ASK YOURSELF:

What's the first thing I want to know about the pencils I buy?

THE ANSWER'S BRIEF:

How long will they last? Now read our COLLIER'S ad at the right.
It's all expressed in four plain words.

Mongol stays sharper longer

MONGOL STAYS SHARPER LONGER*

SCIENTIFIC LABORATORY TESTS

conclusively prove point-sharpness superiority for the exclusive MONGOL Complastic Lead—over the average of all well-known pencils in the MONGOL price range.

*A GOOD
POINT TO
REMEMBER

"Say MONGOL to Your Stationer"

EBERHARD FABER

LEADERSHIP IN FINE WRITING MATERIALS
for 99 years

TRADE MARKS REG. U. S. PAT. OFF.

Among the ASSOCIATIONS

Purchasing Is Not a Clerk's Job

Efficient Purchasing Demands Technical Knowledge about Materials and Equipment, Engineering Knowledge, and also An Understanding of Human Engineering, plus General Administrative Ability

By Andrew H. Phelps
Vice President, Westinghouse Electric Corporation

I have been in purchasing for ten years. Before entering into purchasing, I was a salesman, a sales manager and a sales executive. I am not sure why I was persuaded to take a job in purchasing. If I had known that we were just on the brink of a great World War and what the aftermath and reconstruction of a great World War amounts to, known how hard this job was going to be and how much of one's life had to be given each year in order to carry on a job like this, I think I would have said, "No, I prefer to stay in sales," but I didn't know at the time.

Ten years ago I was in Germany, and I knew from the days I spent in Germany, six of them, that there was a World War on the wing and that it was going to land very fast. All I saw in Germany, ten years ago today, were military roads and military housing. There was a tank parade in a little college town in Southwestern Germany consisting of over 100 tanks. One could observe that the war was on the way.

I returned immediately to the States and decided that it would be necessary to build our purchasing organization strong so that it would last, to build it so it would really accomplish things. Purchasing before that time had been, in our company a function of certain men who had grown up in the service, perhaps starting as office boys without technical training, without executive ability, and without a lot of other things that we had to have in order to build an organization to spend over a million dollars a day, as the organization, which I represent, spends each and every day of the year.

Technically Trained Men

So I came back with a determination to expand this organization and pull into it young technically trained men that would go somewhere in our company and show us the way to accomplish big things in purchasing. Within a year before the war started, we had gathered in over 200 such men, many of them from technical schools, colleges and business schools. Many came from the Harvard Business

Abstract of address at International Night Meeting At Niagara Falls, N. Y., sponsored by the Purchasing Agents Association of Buffalo



Andrew H. Phelps

School. Within another year, we drew in 200 more. Before December 7, 1941, we had taken nearly 1,000 men into our purchasing organizations for different plants. These men brought something to the function of purchasing in Westinghouse.

Now, I think that these particular men, and you have seen some of them here today, young men that have come on and are giving their lives to the profession of purchasing are making possible some of the fine things that a company like Westinghouse can do.

I was pleased, the other day, when having lunch with the president of the Socony Vacuum Oil Company, to have him tell me with considerable pride that he came up through the purchasing business, as he was purchasing agent for that company. Of late, I have met quite a number of men who have been purchasing agents for their respective companies. Most of the men who are going to the top now are men who are in the legal profession or in the purchasing profession, also, some from the selling profession.

I am very much concerned about the growth of purchasing and the part that we, as men, play in purchasing. I have been in purchasing long enough to know that we have been through stress and strain and hard times, ethically, during the last few years.

War does not build character. War breaks character and war has done just that to some purchasing men, because there has been a lot of loose money floating around the natural channels of business. Channels of business have been directed into middle men who have had nothing to do with the production of an

(Please turn to page 256)

New Officers of Milwaukee Association



Shown above are the 1948-49 officers of the Milwaukee Association of Purchasing Agents, chosen at a recent meeting. Reading from left to right, they are: Herbert C. Ketchum, Rundle Manufacturing Company, treasurer; Frederic G. Syburg, Chan Belt Company, national director; Clifford H. Dawley, Ampco Metal, Inc., president; Norman A. Schowalter, West

Bend Aluminum Company, secretary; and W. Howell Pritchard, Kearney & Trecker Corporation, vice-president.

The new officers met in July to formulate plans for the coming year, approve an expanded budget and appoint committees to cover the market on commodities purchased by the membership. Joseph W.

(Please turn to page 256)

Only GOULD Has It!



Gould uses the Metallocscope to photograph high magnifications of the structure of cast lead connectors, parts and grid frames.

A modern research laboratory with pilot manufacturing plant where advance-design batteries are constantly created—and proved before production.

The Metallocscope, a combination high-powered microscope and camera, is helping Gould scientists find the answers to age-old lead casting problems. With it, the complex crystalline structure of lead castings has become an open book. As a result, information rapidly becoming available points the way to even stronger, electrically more efficient grid frames, posts, straps and connectors. For better batteries always, choose GOULD—FOR FIFTY YEARS THE CHOICE OF ENGINEERS.



The Gould "Thirty"—America's finest Industrial Truck Battery!

GOULD

STORAGE BATTERY
CORPORATION

Including the Storage Battery Division
of Philco Corporation

TRENTON 7, NEW JERSEY

Always Use Gould Automobile and Truck Batteries

Engineering Course For Purchasing Personnel Sponsored by Rochester Assn.



Top, left: heat treating laboratory equipment; right, strength of materials laboratory; center, steam turbine in power laboratory, at Rochester Institute of Technology.

An outstanding event in association educational activities will take place October 25 to 29 when a course in "Commercial Engineering for Purchasing Personnel" is

presented at the Rochester Institute of Technology by the Purchasing Agents Association of Rochester. Marking a decided step forward in the training of purchasing

personnel, this unusual course is intended to be an adaptation of the principles of "How to Buy" to the facilities of the Institute, a leading technical school.

Sponsorship of the course by the Rochester association is based on a recognition of the need for an appreciation of tools and techniques by potential buyers and purchasing agents. It was felt that the educational opportunities previously offered to students of purchasing failed to incorporate this factor. It is specifically pointed out that the course emphasizes tools and techniques used by the buyer to bring proficiency to his function, and is not intended as a course in the principles and policies of buying.

In all laboratory and shop practice sessions, the students are to be taught what the tools do, their abilities and limitations, rather than skills in their operation. The first day's program covers mechanical blueprint reading, architectural blueprint reading, and a discussion and laboratory period on preparation of drawings, tracings, reproductions, operations of reproduction equipment. Machine tools, their types, uses, limitations, etc.; casting, molding and extrusion of metals and plastics, and laboratory and demonstration are the subjects of the second day.

Laboratory work and demonstrations on automatic and hand screw machines, and lectures and demonstrations on materials handling and stores methods will be presented during the morning of the third day. A lecture on "Distribution Problems

(Please turn to page 264)

District II Officers Fly to First Rio Grande Assn. Meeting



Led by C. J. McLaren, Tulsa, District Vice President, shown with coat and straw hat being welcomed by L. A. Westlake, President of the Chamber of Commerce, Harlingen, Tex., eight officers of District II, N.A.P.A. are shown just after arriving at the airport to take part in the first official meeting of the Purchasing Agents Association of

the Rio Grande Valley. Others shown (left to right) are John W. Woods; Harold Cosgrove, Ray Johnson, J. Richard Brown, G. C. Heidinger, Sam Harper, C. F. Wilson, J. C. Stockton, Jack Mishler, president of the new association, Mr. McLaren, Felix Staffel, Mr. Westlake, J. W. Driver, Paul Rider, W. R. Casstevens, and Ed Brinsdon.

SPECIALISTS

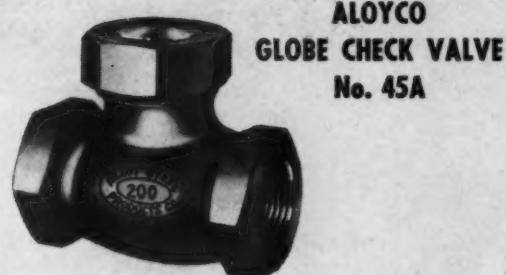
GET BETTER RESULTS

... in baseball



... and in VALVE MANUFACTURE

ALOYCO
ANGLE VALVE
No. 331



ALOYCO
GLOBE CHECK VALVE
No. 45A

ALOYCO
LEVER THROTTLE
GATE VALVE
No. 120



ALOYCO

STAINLESS STEEL
VALVES AND FITTINGS

GATE, GLOBE, Y, CHECK, TANK, SAMPLING AND 3-PORT VALVES
SCREWED AND FLANGED FITTINGS

ALLOY STEEL PRODUCTS COMPANY, INC.

1312 WEST ELIZABETH AVE. • LINDEN, N. J.

**Why
West-Clean
Washrooms
are
Golden
Assets!**



FREE!



A handsomely illustrated brochure is now available upon request. Just fill in the coupon below to discover how your washroom maintenance costs can be greatly reduced—and how you can obtain the Free services of trained West service men.

Because it is serviced fully clean—not just half clean—a West-maintained washroom helps safeguard many things. Your product, perishable or otherwise, for one. Employee health, plant loyalty, and production efficiency are still others.

In fact, one germ-free West washroom may frequently go a longer way toward furthering employee relations than a half-dozen "trouble-shooting" conferences.

West washroom service is thorough for one good reason: where your own janitors, due to lack of time and proper equipment, merely scrape the surface of your washroom problem... a trained West serviceman literally gets to the "bottom" of it by thoroughly cleaning the traps and bowls, and eradicating the hidden cause of annoying washroom odors.

Periodic, efficient and complete—including installation of a modern method of automatic deodorization—this service is extremely economical. Costs nothing extra with your purchase of necessary West Products.

Close to 500 trained West Representatives—from Coast to Coast—are ready to explain the merits of this superior service in full detail. For a quick solution to your washroom maintenance problem, contact us at once.

----- PLEASE CLIP TO YOUR BUSINESS LETTERHEAD -----

Dept. P

WEST DISINFECTING Company 42-16 West Street
Long Island City 1, N.Y.

I would like a FREE copy of "An Ideal Washroom Maintenance Service"

NAME _____

POSITION _____

Milwaukee Officers

(Continued from page 252)

Nicholson, City of Milwaukee Purchasing Agent, assisted by Fred Haker, Director of Purchases of the Allis-Chalmers Manufacturing Company, will head up the educational program in connection with Marquette University during the year. Harold Jungbluth of The Oilgear Company has been named program chairman, and Emil Jones of E. R. Wagner Mfg. Company heads the public relations group in conjunction with the National Association of Purchasing Agents. Several of the Milwaukee association members are active on national commodity group committees which contribute to the published market survey prepared semi-monthly by the national association.



Purchasing Is Not A Clerk's Job

(Continued from page 252)

article or the production of raw material. These fellows, or many of them, were out to make a commission or to split commissions or profits on such raw materials or products as they could steal. Many of these middlemen have been the type of men who would be willing to buy, rob or steal any kind of an order they could obtain. They have been willing to pay any price, even splitting commissions with purchasing men in order to obtain the order.

Now, if our work is to be built up into a professional status, it is going to be necessary for us to have a school in every one of our departments on ethics. No man can be his best unless he is honest with himself. When one of your men accepts a bribe, or a present which grows into a bribe, he is selling himself down the river, and I am sure that this note is timely and is a note that should be sounded with every executive of purchasing. Trying to bring back fundamental ethics which this profession must have is a necessity if we are going to have the standing we should have in the world's work.

This purchasing profession demands of you and me qualities of salesmanship which we must develop. We cannot attain the position we should attain in our respective companies unless we are alert to selling the service purchasing has to offer in our company to all production men, the management and everyone else involved.

The Reciprocity Problem

Purchasing is the greatest spring board for selling there is, and I am not saying that you must use reciprocity to get business. I do not believe in reciprocity as such and I will never use it. The poorest approach that anyone can make to me is to come in and say, "We gave you so much business last year, you now have something to place and we want it." That gets right under my skin and makes my face red. Now, I believe in friendship. If you hand me an order for a 100 motors, what would be my natural reaction? It would be that if I have something to give you, steel for instance, Mr. Bethlehem, I shall be delighted to do it.

(Please turn to page 258)



Ooops... Sorry!

Will an unscheduled jolt to your product in transit bring you another damage claim—or result in loss of consumer good will? You can minimize these worries by safeguarding your product in tough Gaylord Boxes—designed for safe delivery • • Call on the nearest Gaylord Office for competent help on your packaging problems.

160

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Kraft Paper and Specialties

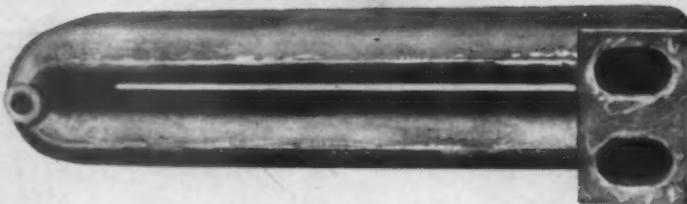
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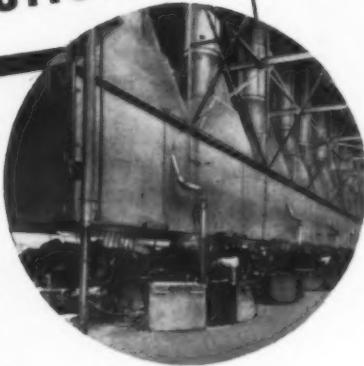
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(Continued from page 256)

Courteous friendship is the thing that accounts for business in purchasing. I think that we should bury the word reciprocity forever because I think it has very, very bad connotations. I think we ought to deal with each other on a friendly basis. Further, let me say, that reciprocity taken to its ultimate end will spell nothing but a sad end. It means the bigger you are, the less you give the little company, the more you give the big company, that can give it back to you and as a result, you have all business floating around the circle of a dozen companies. This would be ruinous to our country and to our American system of life and business. Therefore, I hope that this profession of Purchasing will think less about reciprocity and more about friendship.

Teamwork with Salesmen

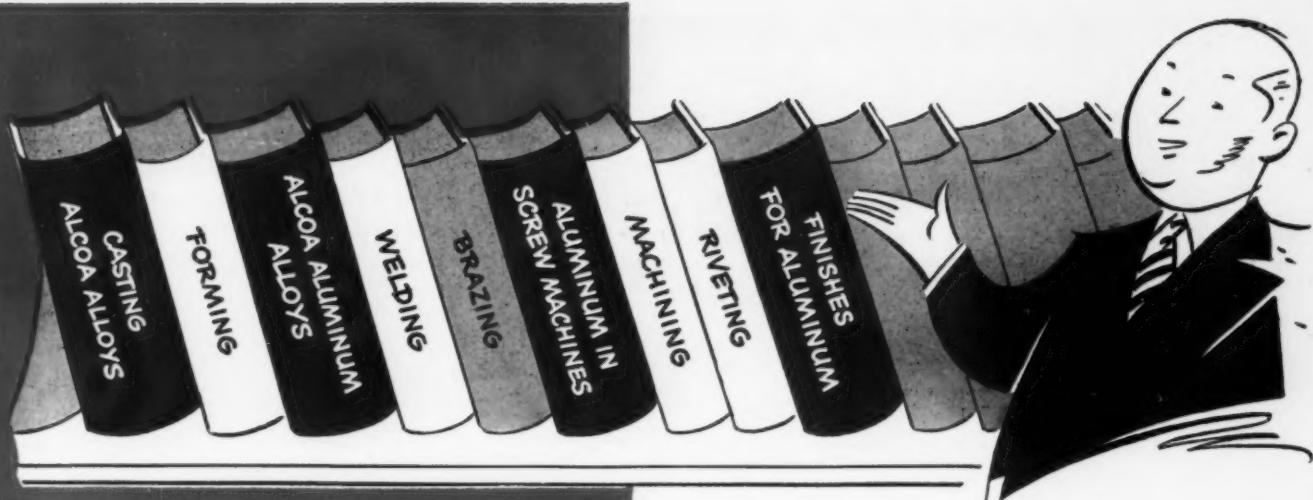
Now, team work is a very essential thing in business. Team work has a fellowship about it. Team work really means cooperation. We should get more of that into our purchasing. I do not know how you enact to young men that call upon you, but when I changed sides of the desk from the front to the back, I said to myself, "Now I hold the whip handle here, but I am not going to use it. I am going to try to be helpful to these young men that are trying to make a living in selling something. I am going to have an open door policy, so that no man will have to wait over ten minutes to see me. I am going to try to draw out of each young man that has something to sell the very best that he can give me with respect to his product. I am going to try to become acquainted with him and his product. I want to put him at ease the minute he comes into my door.

We have maintained our open door policy and we have maintained a friendly attitude toward salesmen. We have saved a great deal of money by not keeping them downstairs cooling their heels for thirty minutes or an hour. You know that when you keep a salesman cooling his heels for an hour or two, you are spending his company's money to the tune of about \$20.00 an hour, \$15.00 an hour, or what have you. You are making the man angry. You are making him really a hater of your company rather than a lover. On the whole, we have maintained this open door policy for ten years. Often times, we have been too crowded to give men the time that they deserve, but we still want to see every man coming to our offices trying to sell us.

We want them to know that we respect their profession and that we want to cooperate with them in helping them get business from our company. Do you know that those young salesmen or those middlemen who have been treated badly somewhere else are our best salesmen after that kind of treatment? I recommend this course of action to every one of you. Consider the other man, consider his time, consider his personality, try to develop in him qualities that will make him a success.

Now, I feel that this profession which we have called our own and which we

(Please turn to page 261)



ALUMINUM PROBLEMS?

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As near as your telephone is your Alcoa Distributor, with a complete library of information on the selection, fabrication, and finishing of Alcoa Aluminum Alloys. Booklets are readily available for your use, on such problems as machining, forming, welding, plating, etc.

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- Whitehead Metal Products Co., Inc.
Phone: CLEVELAND 1475

Cambridge, Massachusetts
Whitehead Metal Products Co., Inc.
Phone: TRowbridge 4680

Charlotte, North Carolina
Edgcomb Steel Company
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Chicago, Illinois
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Phone: REPublic 3000
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HAND BOOK ON HOW TO
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linoleum, rubber,
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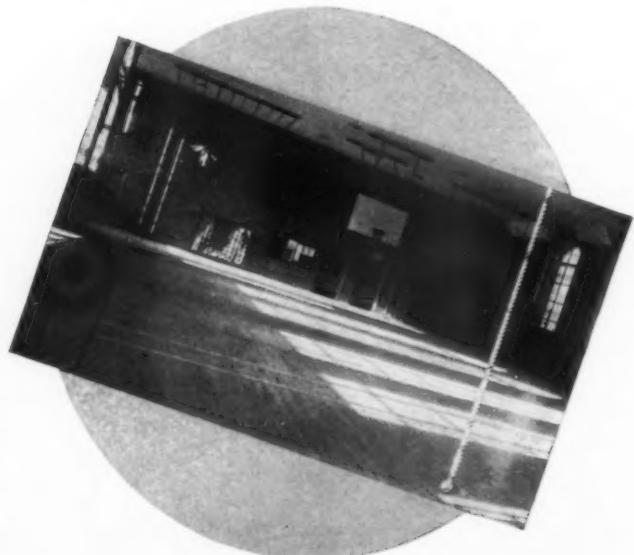
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Represents 50 years of experience of the Horn Laboratories and the endorsement of nationally known manufacturers of floors and floor coverings who through their associations have tried, tested and approved Horn Products.

Use the coupon for your free copy.



(Continued from page 258)

love must continue on to greater heights. I go to the office every morning with a real tang in my nostrils for the work. I do! I go to the office feeling thankful that God has given me another day to work and to accomplish something with men and for men and with industry and for industry; for the success of my company.

I am anxious that as I pass off the scene that I shall have a 100 men, 50 men or 10 men or even one man that shall take my job and carry it on with more success, more understanding and more professionally than I have done. I want to train a man, which is a policy in our company, in every department of our 27 different plants who will succeed the purchasing agent if anything should happen to him, and I want an organization clear down the line that knows their stuff and can do their stuff regardless of what emergency might arise.

Devotion to Service

I want an organization who will not let the Westinghouse Corporation down if and when it should have an emergency. Train your inside men to be great workers and you will see what it will do for a company. This type of organization, this type of devotion to service can only mean results, can only mean a successful company.

Let me say that there are hard days ahead. I thought that when the war was over I could sit back and take it easy and that everything would just flow in as before, but what happened first, a copper shortage as soon as the twelve cent price went off government controls. We could not obtain enough copper to run our plant. What did we have to do? We had to gather up every bit of scrap dust of copper and have it remelted and made into wire bars in order to get enough copper to do the job.

This shortage had only passed when on the stage rushed chemical shortages. We could not have sufficient glass made because we could not get soda ash. Soda ash, that was selling for nine-tenths of a cent a pound. It was raised by the black-market artists up to ten or fifteen cents a pound. When the chemical situation passed off the stage, a steel shortage, worse than we have seen in this country.

I predict that we have not seen the end of all the shortages yet. There are always going to be problems. This is the reason why businessmen cannot depend on clerks and office boys to do their purchasing. It is going to take a lot of qualities to be a purchasing agent in the future. It will be necessary to have some technical knowledge about materials and equipment. It will be necessary to have an engineering knowledge. Maybe the purchasing agent will have to go out to the design board and advise an engineer to put in substitute materials for certain applications to take the place of something that cannot be bought. He will have to have a lot of human engineering traits because he must get along with men and he must get along with his suppliers. He will have to have general administrative ability backed up by good men all around him, — men and women that can really deliver the goods.



Where electrical contact is required to a moving part, laminated precious metal rings offer unusual operating characteristics at a real saving in cost over solid precious metal rings.

Silver or Gold, or Platinum, or Palladium, or their alloys, bonded to the required base metal, such as copper or bronze alloys, make possible . . .

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These rings are now being used in special electric motors, calculators, and computers, Radar, and fire control instruments, potentiometers, and other electro mechanical devices.

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Speeding tools and requisitions by Tubes at International Business Machines, Endicott, N. Y.

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RUSH papers, blueprints, shipping orders, mail, time tickets, small tools and specimens to any desk in your plant.

SAVE time, money and motions. Coordinate your various departments for greater efficiency.

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Cut Materials-Handling Costs up to 30% . . . They eliminate heavy physical work . . . speed production by maintaining a steady flow of materials . . . free men for more important jobs. And they save up to 30% of your manufacturing dollar. Lamson Engineers can design, build and install Conveyors in practically any plant, warehouse or factory.

Through its Allen-Billmyre Division, Lamson also supplies blowers and exhausters in a wide range of capacities for every industrial use.

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Please send me your free bulletin on the following:
 Pneumatic Tubes Conveyors
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Name of company.....

Address..... City..... State.....

My name and position.....

RACINE GROUP NAMES NEW OFFICERS FOR 1948-49

New officers of the Racine Association of Industrial Purchasing Agents were installed at a dinner held recently at Meadowbrook Country Club, Racine, Wis. Ken Hermes, purchasing agent for Andis Clipper Company, was inducted as president.

Other officers installed were: Les Coffin, Walker Manufacturing Company, vice-president; Harold Jacobsen, Oster Manufacturing Company, treasurer; and Vince Gauchel, Webster Electric Company, secretary. James E. Bunck, Jacobsen Manufacturing Company, is retiring president.

111 PANHANDLE ASSOCIATION JOINS IN TEXAS SURVEY

Members of the Purchasing Agents Association of the Texas Panhandle are assisting in a statewide products manufacturing survey being conducted under the sponsorship of Texas A & M College. Jess Pate, president of the association, and purchasing agent of the City of Amarillo recently stated that survey questionnaires have been distributed to buyers and manufacturers to determine exactly what is manufactured in Texas and what products have a market in the state. Facts collected in the survey will be used as a basis in outlining new industrial opportunities in the state to manufacturers not already located there.

(Please turn to page 264)

"1001" Styles of Industrial Gloves to Save Workers' Hands



Suit the glove
to the job—
to cut your
costs, step up
production

Typical of the outstanding Olympic line is this famous Olympic "Frizzly" fabric glove (#544), designed for handling hot materials, soldering, welding, etc. Surface of knit cloth is covered with soft, sturdy pile of looped threads. Strong—comfortable—washable, 24 oz. weight throughout. For men and women. With knit wrist as shown—also long or short fabric cuff. 2 types of material, water repellent or flame proof. Economical and durable, Olympic work gloves are used by hundreds of leading manufacturers, wherever work stoppage or slow-down is threatened by hand injury. Remember . . . there's an Olympic glove for every job!

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Send for Illustrated Catalog
of Safety Work Gloves, Finger
Protectors and Safety Apparel.

OLYMPIC GLOVE COMPANY Inc.

95 Madison Ave., Dept. 9, New York 16, N. Y.

Darnell Casters

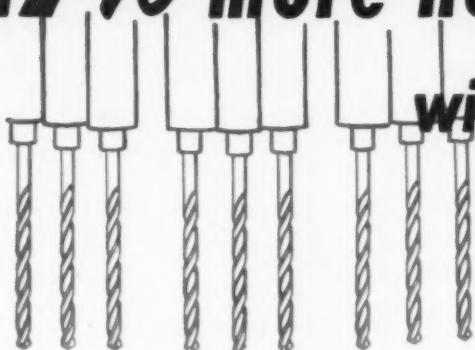


It's easy to select the
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27% more holes per grind with this CLE-FORGE stock drill



Gives Big Increase
in Performance



● CLE-FORGE High Speed Drills had been giving good performance on this job—drilling holes $1\frac{3}{4}$ " deep in cast iron at 80 f.p.m., with an average of 245 holes per grind. ♦ One of our Service Representatives, however, believed that even better results could be obtained by using another type of CLE-FORGE High Speed Drill (also a stock item). By following his recommendation the average number of holes per grind was increased to 312. ♦ Cleveland Service Representatives are trained to help you increase your production and reduce your costs. Contact our nearest Stockroom, or . . .

Telephone Your Industrial Supply Distributor.



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1242 East 49th Street

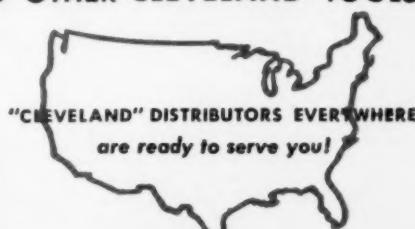
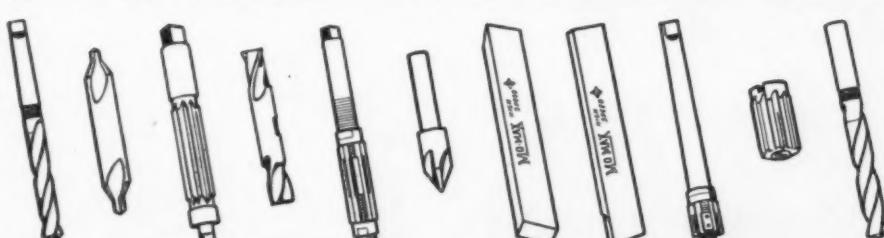
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The screws, bolts, nuts or other threaded fastenings used in the assemblies of your product are determining factors in the length of its consumer service.

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are precision-made of the finest materials to insure speedy application and enduring service. Accurate and rugged they effect production economics by reducing driving time, waste and spoilage. But most important, in the assemblies of your product their precise, uniform thread form and structural strength defy the loosening effects of vibration to assure long, trouble-free service. Specify HOLTITE for your next fastening requirements.



CONTINENTAL SCREW CO.

New Bedford,
Mass., U.S.A.



Engineering Course at Rochester (Continued from page 254)

and Price Structure" and a plant visit will be held in the afternoon.

The entire fourth day will be given over to the subject of verification of quantity and quality. Included in the discussion and laboratory work will be the quality specification, receiving room practices in relation to quantity and quality of purchased items, quality control procedures, contributions which can be made to the purchasing function by the quality control departments, scientific sampling methods, and a laboratory session on measuring and test equipment.

A lecture on a selected group of commodities, with emphasis placed on new product developments will feature the morning session of the final day, and the afternoon session will be given over to the subject containers and packaging.

Teaching personnel for the course will be composed of institute faculty members and experts in each field from private industry.

Enrollment, which is limited to 60 students, is expected to be drawn from students in mid-western and southern states, as well as the entire eastern seaboard. All students will be accommodated at the Hotel Rochester, one block from the school. Applicants should make their own reservations at the hotel. A block of rooms will be reserved by the hotel to cover the reservations. Tuition for the course will be \$60.00, which includes all books and materials and one banquet meeting to be held in connection with the regular monthly meeting of the association. All other expenses will be borne by the students. Inquiries should be directed to Alfred L. Davis, Associate Director, Evening and Extension Division, Rochester Institute of Technology, Rochester 8, N. Y.

1 1 1

SIXTH DISTRICT CONFERENCE AT CINCINNATI

The following program is scheduled for the Sixth District Conference, which is to be held at Cincinnati, Ohio, September 27 and 28, 1948:

Monday, September 27th: Address by Charles R. Hook, president, Armco Steel Corporation.

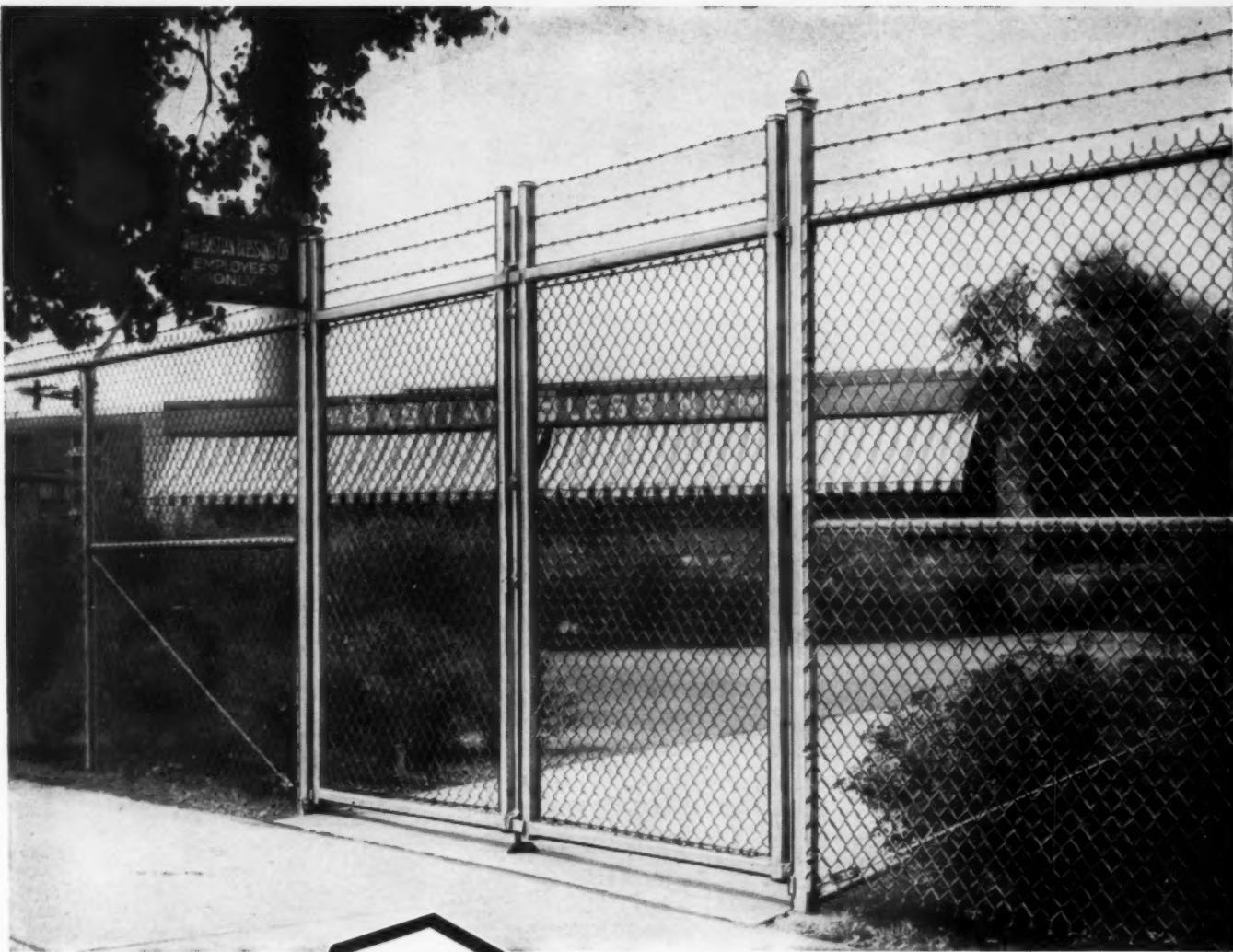
Purchasing and Cost Reduction, D. B. Henderson, chairman;

Commodity Discussions: Paper, J. O. Gano, chairman; Building Materials and Lumber, Thomas Daugherty, chairman; Non Ferrous Metals, Earl Jung, chairman; Containers; Lawrence J. Wernke, chairman.

Annual banquet; Ralph O. Keefer, president, N.A.P.A., and purchasing Agent, Aluminum Corporation of America; James E. Gheen, speaker, subject, "Little Do We Know."

Tuesday, September 28th: Industrial chemicals and Plastics, Andrew Lincoln, chairman; Fuels; Iron and Steel, Jack Breese, chairman.

(Please turn to page 266)



Puts a **STOP** to Trespassing!

Like a tough, durable sentinel, an Anchor Chain Link Fence will keep your plant grounds and buildings free of trespassers, snoopers, agitators, all kinds of trouble-makers. It is made in a wide variety of heights and styles. One of our trained Anchor Fence Engineers can recommend the installation best suited to your needs.

In addition, an Anchor Chain Link Fence enables you to make full use of outdoor space with utmost safety, for storing materials and supplies . . . thus freeing factory space and making it unnecessary to build at this time. And it will help you direct a lot more sys-

tematically the flow of motor traffic and employees in and out of your plant.

Extra life and greater protection are built into every Anchor Fence through several time-tested, *exclusive* features. *Deep-Driven Anchors* are an example. They are clamped to the posts at right angles to the fence line, driven deep in the subsoil to hold the fence erect and in line at all times. Ask your local Anchor branch for more details, or write for the informative booklet shown below, to: **ANCHOR POST FENCE DIVISION**, Anchor Post Products, Inc., 6615 Eastern Ave., Baltimore 24, Maryland.



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FREE ILLUSTRATED CATALOG**

Contains structural diagrams, specification tables, installation photos of many types and uses of Anchor Chain Link Fence in leading plants all over the country.

Anchor Fence

Nation-wide Sales and Erecting Service



Save on heavy-duty cleaning!

Read how the new General Electric Commercial Vacuum Cleaner cuts costs two ways!

1—You can save the surfaces of your floors, rugs, and linoleum with the new General Electric Commercial-Industrial Vacuum Cleaner!

The fast, efficient action of G.E.'s new cleaner removes dirt and dust *completely*—gets it so clean you add *years* of life to all surfaces!

2—It's built to last! General Electric's Commercial Vacuum Cleaner will stay on the job a long, long time!

FAST • EFFICIENT • QUIET • ECONOMICAL

**The New General Electric
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GENERAL  ELECTRIC

Appliance & Merchandise Department, Section 215
General Electric Company, Bridgeport 2, Conn.

Send descriptive literature concerning

() Wet and Dry Pickup Vacuum Cleaner
() Dry Pickup Vacuum Cleaner

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Progressive Purchasing

by
R. L. Van Cleave
Director of Purchases
Carnegie-Illinois Steel Corporation
United States Steel Corporation Subsidiary

If there ever was a time when purchasing of the highest calibre was needed, that time is now. The need demands real men, men who have their feet on the ground, with their feet warm but their heads cool, men who are not easily swayed by the everchanging winds, but who know what they are talking about, men who can be diplomatic and courteous yet firm, and—if necessary—tough.

I would like to provoke your thinking by stating some of the subjects to which we have given considerable time and attention in a self-examination directed toward progressive purchasing. Are you entirely satisfied with the organization structure of your department? Is your present organization the best type, in your opinion, to do the job? Is it a type of organization that you could defend even if the operations of your company were 50 per cent of capacity? What about the quality and quantity of personnel?

The matter of developing an adequate organization structure is of first importance. Thinking at this point must be divorced from present personnel and directed entirely to organization structure and principle. Only after such a structure has been developed and the proper number of positions determined is it appropriate to consider personnel.

An important phase of personnel administration is in the consideration of young people in a department, those who have less than five years experience. Unless management takes a personal interest in determining qualifications of each young man and his adaptability to purchasing activities, it may be found after several years that he has failed to make progress because he is unsuited to purchasing work. If such misplacement is discovered promptly, and steps taken to locate the individual properly, the results will be mutually beneficial to him, the department, and the company.

Training Program Necessary

Conditions surrounding procurement over the last eight years have been such that practices now rather prevalent should be corrected. We need to re-think purchasing and we should get back to sound fundamentals as the proper starting place. We should be more careful in the selection of new employees in purchasing. The new employee is entitled to more information than he frequently gets. Granted that "Experience is the best teacher" and that much ability can be acquired from doing the job each day, some kind of a training program is necessary if the desired results are to be accomplished within a reasonable time.

The larger the department the broader the scope of training required. You cannot expect a man to do a job to your satisfaction if you have never told him just how you want the job done. Therefore, any training program must be specific both

(Please turn to page 270)



Top: Mechanical Department Laboratories. The Screw Machine Laboratory is adjacent to and part of the General Laboratory layout.

Above, and at right: Typical views of students doing screw machine set-up, operation and layout work.



HATS OFF TO R.I.T.

for its co-operative course in Screw Machine Technology

The Rochester Institute of Technology, founded in 1829, has pioneered in co-operative education for more than a quarter of a century. Through alternate periods of school and field work, the Institute provides a program of education in which students may correlate technical instructions with practical, on-the-job experience in industry.

With active co-operation from the National Screw Machine Products Association, the Institute now offers a major subject in "Screw Machine Technology." The program meets a real need for technically trained men in this field. Students are taught to design screw machine tools and cams; to set up and operate turret lathes and a variety of single and multiple-spindle automatics; to do layout work—and to compute costs by approved methods.

Again, hats off to R.I.T. for its efforts toward better screw machine products at lower cost—a goal made possible through the use of modern machines, the know-how of efficient tooling, and the use of rod stock of maximum machinability.

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut

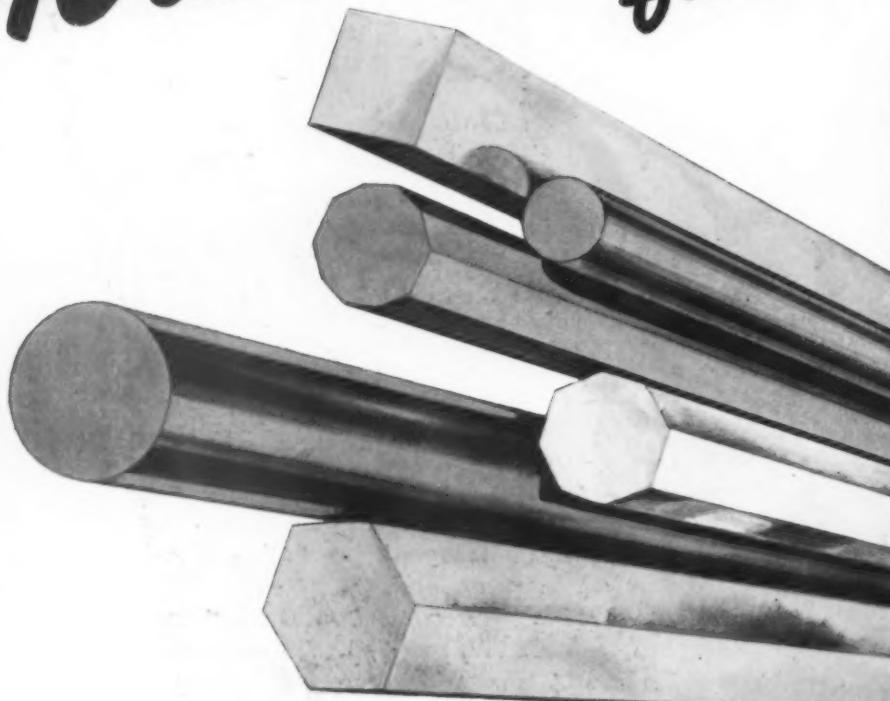


Anaconda

FREE CUTTING RODS



46 COPPER AND COPPER ALLOY RODS from which to choose



ALL users of rod stock will agree that there is usually ONE best rod for a specific application. Finding that rod is sometimes a problem. If you feel that the practical metal-working experience of our Technical Department may be of assistance, let us know. We'll be glad to co-operate.

Listed here are 46 of a large number of Anaconda Copper and Copper Alloys manufactured in rod form. They are made in all commercial sizes and shapes. Special Shapes in rod form are also produced by The American Brass Company in copper, brass, bronze and certain nickel silver and phosphor bronze alloys.

Publication B-14 goes into detail on Anaconda Copper Alloy Rods. Publication B-3 offers practical suggestions for machining. Either one or both of these booklets will be mailed on request.

48114

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut
Subsidiary of Anaconda Copper Mining Company
In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.



19 Free Cutting Rod Alloys

COPPERS

Leaded Copper—946
Selenium Copper—948

LEADED BRASSES

Leaded Commercial Bronze—202
Hardware Bronze—267
Leaded Red Brass 80%—205
Leaded Brass—211
Bult Brass—229
Free Cutting Yellow Brass—271
Forging Brass—250
Extruded Architectural Bronze—280

SPECIAL BRASSES

High Strength Commercial Bronze—286
Leaded Naval Brass—612

PHOSPHOR BRONZES

Special Free Cutting Phosphor
Bronze—610
Leaded Phosphor Bronze 5%—979
(Grade B)

NICKEL SILVERS

Extruded Leaded Nickel Silver 10%—823
Leaded Nickel Silver 12%—796
Leaded Nickel Silver 18%—789

COPPER-SILICON ALLOYS

*Everdur—1012 (Leaded)
Everdur—1014

27 Other Machinable Rod Alloys for General and Engineering Uses

COPPERS

Electrolytic Tough Pitch Copper—100
Deoxidized Copper—939

BRASSES

Commercial Bronze 90%—14
Red Brass 85%—24
Low Brass 80%—32
Yellow Brass—61
Muntz Metal—66

SPECIAL BRASSES

Naval Brass—452
*Tobin Bronze
Manganese Bronze—937

PHOSPHOR BRONZES

Phosphor Bronze 4%—903 (Grade A)
Phosphor Bronze 5%—351 (Grade A)
Phosphor Bronze 8%—353 (Grade C)
Phosphor Bronze 10%—354 (Grade D)
Phosphor Bronze—314
Phosphor Bronze—316

NICKEL SILVERS

Nickel Silver 18%—719
Nickel Silver 18%—724
*Ambrac—850

CUPRO NICKEL

Super Nickel—702

ALUMINUM BRONZES

Ambraloy—901
Ambraloy—928
Ambraloy—917
*Avicelite—915

COPPER-SILICON ALLOYS

*Everdur—1010
Everdur—1015

CHROMIUM COPPER—999

*Trade-Mark Reg. U. S. Pat. Off.

We take our own medicine

INDUSTRIAL REFRIGERATION for anodizing aluminum...air conditioning for precision assembly of small parts...refrigeration for cooling of quench baths...

Month after month industry finds new ways to speed production, control quality through heat transfer equipment.

General Electric has pioneered in many of these fields, putting new processes to work in G. E.'s own factories. That's one reason why General Electric equipment is so well adapted to widely diversified industrial needs.

Ask your General Electric Contractor or Distributor for suggestions in applying heat transfer equipment to your industry. Or send the coupon for free General Electric Book.

Stratosphere Chamber—reproduces atmospheric conditions equivalent to 75,000 feet above sea level.

Low Temperature Cabinet—Can be varied from -100 degrees to plus 175 degrees F.

12 G-E CM-124 Compressor Units run a battery of test cabinets, including the two pictured above.

Rx FOR TESTING ELECTRONIC MATERIALS

General Electric uses G-E refrigeration in one of its factories to put radio and electronic materials to rigid tests. Test cabinets that produce temperatures as low as -100 degrees F. require the high volumetric efficiency and proven reliability of General Electric Compressors to achieve the desired results day after day.

GENERAL ELECTRIC

Industrial Refrigeration and Air Conditioning



**Get this
FREE book**

"New Industrial Dimensions" describes 17 important applications... gives photos and diagrams of basic heat transfer methods.

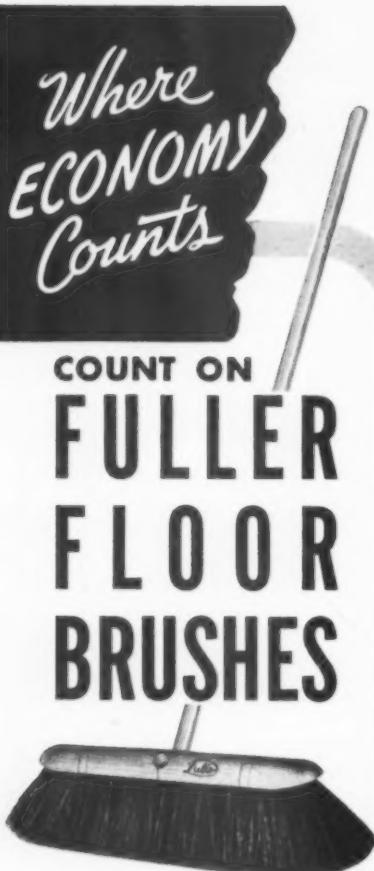
General Electric Co.,
Air Conditioning Dept., Section A8299
Bloomfield, N. J.

Please send me FREE copy of the General Electric book "New Industrial Dimensions."

Name _____

Address _____

City _____ State _____



• Specially constructed of selected filler materials.

• Full, firm sweeping surface that wears down evenly.

• Wide flare for covering large areas quickly.

• Long trim sweeps clean — wears longer.

• Solid, polished hardwood blocks — two threaded handle holes.

Widths from 12" to 36".

A size and style to meet your every sweeping need.

TELEPHONE your Local Fuller Branch Office or write

The FULLER BRUSH Co.
INDUSTRIAL DIVISION

3554 Main St. • Hartford 2, Conn.

In Canada: Fuller Brush Co., Ltd., Hamilton, Ont.

(Continued from page 266)
as to who will instruct and what the subjects will be. A top buyer should preferably have spent three to five years in the operating end of the business before starting in purchasing. He must be well informed in three categories if he is to qualify. They are:

1. He must have complete knowledge of the assigned commodities.

2. He must know sources—who makes the best — developments in manufacturing, competitive materials, prices, market trends, changes in conditions affecting availability, shipments, etc.

3. He must know what the plant does with the items he buys, what is a good one and why, what would make the item more satisfactory to the plant, or make a more economic purchase, etc.

Too Long In Seller's Market

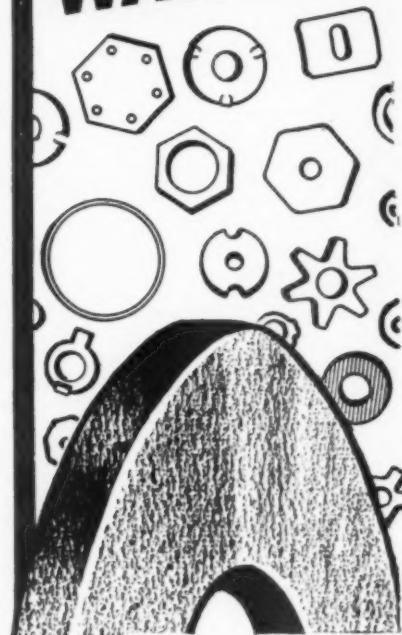
We have been in a seller's market for so long a time that habits have been formed. In some respects, we have not been purchasing. We have been trying to get someone to take an order. We should begin again to require the seller to solicit. We may not be able to do all we would like at once, but there are some specific directions for our efforts which can be started now.

For example, we can know more about the quality of purchased items. Standards can be established and reasonable tests made to determine the answer. Your greatest interest is in those purchased materials which go into your product. Your next interest is those purchased ma-

(Please turn to page 272)

THINK OF
"MASTER PRODUCTS"
WHEN YOU NEED

SPECIAL WASHERS



Yes—each of our Special Washers is a master product . . . the result of more than a quarter of a century of experience in designing and producing washers of every description.

Let us help you solve your problems on Special Washers and Small Stampings. If one of our 10,000 sets of tools does not satisfy your requirements, our well-trained Tool and Die Department will be glad to work from your blue-prints.

Our long list of satisfied customers is your assurance that we can serve you well.

THE
MASTER PRODUCTS
COMPANY

6400 PARK AVE. • CLEVELAND 5, OHIO

the grinding job

Floor stand snagging steel castings on a Safety Rite-Speed Grinder running at 9,500 surface feet per minute. This is heavy duty production work requiring a wheel that can "take it" yet give fast grinding action and low costs.



the wheel

Borolon resinoid bonded, A20-Q7-B1, 30" x 3" x 12" . . . adopted as standard on the basis of total cost per pound of metal removed . . . plus the extra advantages of Red Streak Flanges which protect the center hole—steel fits against steel—substantially reducing maintenance cost on grinding equipment. This is a patented feature exclusive with Simonds Abrasive Company.



Borolon **Electrolon**
ALUMINUM OXIDE SILICON CARBIDE

SIMONDS
ABRASIVE CO.

PHILADELPHIA, PA.

Grinding Wheels

Every size and shape for every grinding job . . . centerless, crankshaft, cut-off, cylindrical, internal, knife grinding, mounted points, portables, roll grinding, saw gumming, snagging, surfacing (wheels and segments), tool and cutter, bricks, sticks, stones and abrasive grain for polishing, pressure blasting, anti-slip, etc.

Available Everywhere



SIMONDS
ABRASIVE CO.
GRINDING WHEELS

where to get it

Simonds Abrasive Distributors in all principal industrial centers of the U.S. and in many foreign countries carry stocks and can advise on grinding wheel selection. Write today for informative Bulletin ESA-154 on Snagging Wheels and Red Streak Flanges. Also for name of distributor nearest to you.

For more than 50 years Simonds Abrasive Company has been a major manufacturer of grinding wheels and abrasive products exclusively. From grain to grinding wheel, complete quality control has governed our manufacturing processes. This starts with the crude abrasive produced by Simonds Canada Abrasive, Ltd.—continues throughout every stage of processing in our Philadelphia plant—and proves itself in economical long lasting performance wherever Simonds Abrasive Company Grinding Wheels are used.

SIMONDS
ABRASIVE CO.

Philadelphia, Pa.

Electric Furnace Plant, Simonds Canada Abrasive Co., Ltd., Arvida, P.Q.

SIMONDS ABRASIVE COMPANY

is a division of

SIMONDS
SAW AND STEEL CO.

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Saws, Machine Knives, Files

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SIMONDS
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Montreal, Can.
Simonds Products for Canada

SIMONDS ABRASIVE COMPANY, PHILADELPHIA 37, PA. • DISTRIBUTORS IN ALL PRINCIPAL CITIES

CAN YOU GUESS THE ANSWERS?



DO SHIPS CARRY WILDCATS?

A "wildcat" on a ship is a chain winch, used to raise and lower the anchor. Above and below decks, ships use many different Welded and Weldless chains made by ACCO's American Chain Division.



CONTAINS MORE CARBON?

The steel in this Valve is hardened by the addition of less than 1% of carbon. The human body contains about 18%. Valves are made by ACCO's Reading-Pratt & Cady Division for many industries.

HOW MANY PEOPLE TRAVEL BY AIR?

American people take 13 million air trips annually. One of ACCO's important contributions to the aircraft industry is control cable and fittings, made by the Automotive and Aircraft Division.



ACCO Products Include: AMERICAN Chain • TRU-LAY and LAY-SET Preformed Wire Rope • TRU-LAY Cable and TRU-LOC Swaged Terminals for Aircraft • TRU-STOP Emergency Brakes • PAGE Wire, Chain Link Fence and Welding Rods • CAMPBELL Abrasive Cutters • READING-PRATT & CADY Valves and Fittings • READING Steel Castings • PENNSYLVANIA Lawn Mowers • MARYLAND Bolts & Nuts • "ROCKWELL" Hardness Testers • WRIGHT and FORD Hoists • HELICOID Pressure Gages • MANLEY Automotive Service Equipment • OWEN Silent Springs.

ACCO



AMERICAN CHAIN & CABLE BRIDGEPORT CONNECTICUT

(Continued from page 270)

terials which contact your products. Your last interest is in those purchased materials which are a factor in operating costs. We should know whether or not the plant is getting a dollar's worth for each dollar spent.

On the service side of the purchasing function, we should arrange to get more factual data, so that our buyers are better advised on performance. Then they can be expected to place purchase orders with knowledge that the company's money is being more wisely spent. Under more competitive conditions, we should investigate items which involve sizeable expenditures to determine if a more satisfactory product cannot be developed.

To do a better job, there are other factors which should be given attention: 1. combining needs for the same commodity by several departments of the plant; 2. the scheduled purchase of repetitive items in order to minimize the number of purchase orders issued in any given period of time; 3. the issuance of more standing orders for extended periods, against which releases can be made, provided the sources can be properly established.

The picture is ever-changing and demands new techniques, an alert and flexible mind, and an approach which is definitely progressive.

Condensation of paper presented before Purchasing Agents Assn. of Cincinnati, O.

CHATTANOOGA ASSOCIATION VISITS TWO LOCAL PLANTS

Visits to two local plants featured the July meeting of the Chattanooga Purchasing Agents Association. The group met for a buffet supper at the Norge Company then went through the plant, at which all compressors going into all types of Norge refrigeration units, as well as Norge water coolers, are manufactured.

Following that visit, the group went to the Southern Electrical Company's plants, at which are manufactured all types of guy and transmission electrical cables.

ST. LOUIS ASSN. EXCURSION

The annual boat excursion of the Purchasing Agents of St. Louis was held on Tuesday evening, July 20. L. A. Dahlheimer is chairman of the entertainment committee, which had charge of the affair.

LOS ANGELES ASSOCIATION ELECTS 1948-49 OFFICERS

New officers of the Purchasing Agents Association of Los Angeles for the 1948-49 year are: Burt M. Pulver, Barker Bros. Corp., president; C. H. Tuttle, Standard Oil Company of California, first vice-president; Virgil D. Waters, Utility Trailer Mfg. Company, second vice-president; Dean L. Fisk, Los Angeles Turf Club, Inc., secretary; A. B. Tieren, Southwest Welding & Mfg. Co., national director; and Fred V. Keenan, Pipe & Supply Co., and Frank D. Lortscher, Signal Oil & Gas Company, directors.

(Please turn to page 274)

Common Sense Cap Screw Safety —

CLEVELAND Top Quality

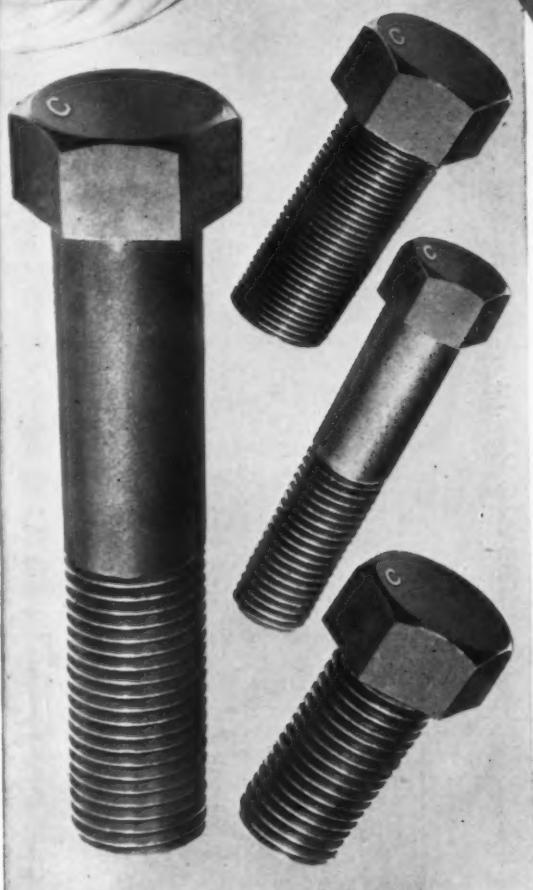
"High Carbon Heat Treated"

Made extra strong

by

DOUBLE
EXTRUSION

— the Kaufman Process



Wise buyers of machinery and equipment watch for safety and maintenance factors—know what to look for in the way of sturdy accessible fasteners that facilitate adjustments, set-up changes and repairs.

Cleveland High Carbon Heat Treated Cap Screws are dependable for strength, accurate fit and clean-running threads. They cost very little more than ordinary cap screws, yet they have all the desirable qualities recommended by metallurgists and engineers. Cleveland makes a full range of sizes including *diameters up to 1½ inches*. Write for more information and prices.

Cleveland Specialization assures you
highest standards in fasteners.

CAP SCREWS



MILLED STUDS



SET SCREWS



CLEVELAND
Top Quality
FASTENERS

The Cleveland Cap Screw Company

2917 EAST 79TH STREET • CLEVELAND 4, OHIO

SPECIALISTS FOR 30 YEARS IN CAP AND SET SCREWS AND MILLED STUDS

Warehouses: Chicago and Philadelphia

Ask your Jobber for Cleveland Fasteners

TOUREK

for over 28 years manufacturers of
PRECISION SCREW MACHINE PRODUCTS
and
THE FAMOUS LINE OF TOUREK BALL JOINTS



SIMPLIFIED
DESIGNED
with
IMPROVED
PERFORMANCE

TOUREK BALL JOINTS

In the products illustrated, and in scores of others, Tourek Standard Ball Joints contribute to simplification of design and improvement in performance. Special designs in ball joints are available to meet the demands of your specifications.

Large diversified batteries of the latest type 6-spindle automatics can assure you outstanding precision and values on your screw machine parts requirements.

Write for Tourek's 16-page illustrated catalog, containing complete specifications on 12 standard types in 54 sizes, as well as data on special types. Or, if you want prices on your screw machine product needs, send prints.

J. J. TOUREK MFG. CO.
4701 W. 16th Street
Chicago 50, Illinois

ESTABLISHED 1920

TOUREK
FAMOUS BALL JOINTS



MAKERS OF PRECISION
SCREW MACHINE PRODUCTS

AMP

Certi-Crimp

HAND TOOLS

Prevent Faulty Electrical
Connections



If you use hand-tool installation of AMP solderless terminals, be sure every tool has the AMP "Certi-Crimp" feature. Prevents connection failure due to insufficient crimping pressure. Tool handles cannot be re-opened until closed completely for perfect crimp. Guards against operator carelessness or fatigue. Positive, inexpensive, fool-proof. Increases convenience of tool. Fully tested in laboratory and actual service. Write for full details. Ask for Catalog Section 30-F.

AIRCRAFT-MARINE PRODUCTS Inc.

1319 North 4th Street, Harrisburg, Pa.

Sole Canadian Representative: F. Manley & Sons, Ltd., Toronto, Ont.

"PRECISION ENGINEERING

AMP

APPLIED TO THE END OF A WIRE

PACIFIC-INTERMOUNTAIN CONFERENCE SEPTEMBER 24-25

The third annual Pacific-Intermountain Purchasing Agents Conference will be held on September 24 and 25 at the Hotel Biltmore, Los Angeles, Calif., with the Purchasing Agents Association of Los Angeles playing host to the two other participating groups, the Purchasing Agents Associations of Northern California and Utah. Theme of the meeting will be "Impacts of 1948-1949".

The first general session following the opening luncheon will hear speakers discuss "The European Relief Program, Armament and Air Force Programs and Their Effect on Industry". Smaller forums will be held later in the afternoon on various commodities.

Buyers groups in the following classifications will hold forums on Saturday morning: iron and steel, governmental, oil company, packaging, food and agricultural, and distributors.

A general session following the group forums will close the conference. Principal speaker will be George A. Renard, executive secretary-treasurer of the National Association of Purchasing Agents.

The conference committee is headed by General Wayne R. Allen, who is acting as general conference chairman, assisted by L. T. Bleasdale, program; F. D. Lortscher, registration and hotels; Wm. H. Steward, forums; E. Benton Long, luncheon and banquet; Milton Gincig, plants visit; G. A. Selby, special events; A. B. Tietjen, Burt M. Pulver and Arthur Baker. E. G. Gergren, San Franc'sco, is vice-chairman of the conference, representing the Northern California association and K. H. Searle of Salt Lake City is vice-chairman, representing the Utah association.



CINCINNATI ASSOCIATION HOLDS ANNUAL GOLF PARTY

The annual golf party of the Cincinnati Association of Purchasing Agents was held at the Kenwood Country Club on Tuesday, August 17. Buffet luncheon was served and dinner was held in the evening.

Featured on the after dinner program was a talk on "Guns With A Past" by Glade Bailey, District Manager, Dictaphone Corp. The talk was given in cooperation with the Cincinnati Police Department, and a collection of famous guns used by criminals and law enforcement officers was on display.



MERMAIDS FEATURED AT ALABAMA ASSN. PICNIC

The annual picnic and summer outing of the Purchasing Agents Association was held at Roebuck on Friday, July 30. Entertainment was provided by Lanette Ell's, Southern diving champion, and her "mermaids", featuring diving exhibitions and a water ballet. The program was arranged by the entertainment committee, headed by Roy Evans.

(Please turn to page 276)

Whistling good idea for saving gas

Fill 'er up! And don't worry about a gas overflow with its fire hazard and waste. Not on this car!

For a keen-thinking chap took a piece of tubing and designed a whistling gas-tank signal for automobiles that warns the attendant the tank is getting full. And his product is sweeping the market.

The tubing used is furnished by Bundy.

The idea was like any you could have. For you'd be amazed at where you can use Bundy tubing to put a business in the clover.

Look at the examples at the right. Some show present uses for Bundy. Others show altogether new ones which we think could pay handsome dividends to someone who would make them . . . maybe you. Better read them carefully.



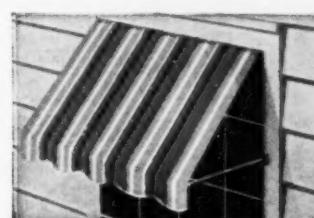
1 Automotive Engineers needed a strong, vibration-proof tubing for hydraulic brake lines. Someone said, "Let's try Bundyweld* . . . it's double-walled from a single strip." Now Bundy's in 95% of all cars!



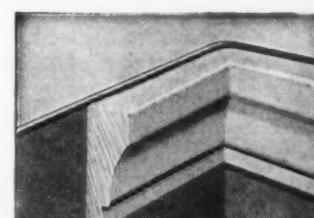
2 Manufacturers of water coolers snapped up Bundy steel tubing, too, for condensers and other vital tubing parts. It's fast-cooling, easily fabricated. (Beer coils, too, are made of Bundyweld . . . in nickel, for purity!)



3 Bundy's in ball-point pens, too. Cartridges of Bundy Tubing hold "ink" enough for years. Tubular toys and fishing-rod tips are other unusual places where Bundy's been used to someone's profit. As for new ideas—



4 Why not use weather-resistant Bundyweld for lightweight awning frames? Bundy might well lower costs, give faster, easier installations. It's machineable, ductile, strong and readily bent to any turn.



5 Automatic burglar and fire alarm systems of Bundyweld are another idea to check on. Bundy's thinner walls mean faster heat conductivity. No other tubing offers all of Bundy's features. In steel, Monel or nickel.



BUNDY TUBING



*REG. U. S. PAT. OFF.

WHY BUNDYWELD IS BETTER TUBING

Bundyweld Tubing, made by a patented process, is entirely different from any other tubing. It starts as a single strip of basic metal, coated with a bonding metal.

This strip is continuously rolled laterally into tubular form. Walls of uniform thickness and concentricity are assured by close-tolerance, cold-rolled strip.

6 What is your design or production problem . . . or even your idea? Regardless of the kind of product, Bundy engineers might easily help you over the hurdles through a simple use of Bundyweld along the line . . . and give you a stronger, better unit made faster at less cost. It's worth investigating. Just call or write *Bundy Tubing Company, Detroit 14, Michigan*.

Bundyweld comes in standard sizes, up to $\frac{3}{8}$ " O.D., in steel (copper or tin coated), Monel or nickel. Special sizes can be furnished to meet your requirements.

Bundy Tubing Distributors and Representatives: Cambridge 42, Mass.: Austin-Hastings Co., Inc., 226 Binney St. • Chattanooga 2, Tenn.: Peirson-Deakins Co., 823-824 Chattanooga Bank Bldg. • Chicago 32, Ill.: Lapham-Hickey Co., 3333 W. 47th Place • Elizabeth, N.J.: A. B. Murray Co., Inc., Post Office Box 476 • Philadelphia 3, Penn.: Rutan & Co., 404 Architects Bldg. • San Francisco 10, Cal.: Pacific Metals Co., Ltd., 3100 19th St. • Seattle 4, Wash.: Eagle Metals Co., 3628 E. Marginal Way • Toronto 5, Ont., Canada: Alloy Metal Sales, Ltd., 881 Bay St. **Bundyweld** nickel and Monel tubing is sold by International Nickel Company distributors in all principal cities.



SEAL

with babbitted shims

THESE BABBITED SHIMS, combining babbitt lugs with the adjustable precision thickness of the "solid" LAMINUM shim, allow complete take-up to tolerance. With assurance of seal against oil and pressure loss. No miking, filing or grinding... peel with a jackknife.

LAMINUM, the "solid" shims of precision brass or steel laminations that peel for adjustment, are stamped by us to your specifications.

Our engineers will send you data and application chart and advise you on the use of babbitted shims.

Laminated Shim Company, Inc., Glenbrook, Conn.

3034

LAMINUM
THE SOLID SHIM THAT
peels FOR
ADJUSTMENT

DISTRIBUTE PRINCIPLES & PRACTICES CARD

President J. J. Morse of the Purchasing Agents Association of New Orleans has sent to the membership on behalf of the officers and board of directors, copy of the "Principles and Standard of Purchasing Practice" advocated by the National Association, printed on heavy paper stock, 9" x 13 1/2", suitable for framing. It is the plan to give each new member a framed copy at the first meeting he attends.

MISSISSIPPI GROUP HAS SUMMER OUTING

The first annual summer outing of the Mississippi Association of Purchasing Agents, Jackson, Miss., was held at Allisons Well on Saturday, August 7. The affair began in mid-afternoon and included swimming, ping-pong, billiards, card games, horseshoes, etc. Dinner was served in the evening.

WASHINGTON ASSN. HAS BUSY SUMMER PROGRAM

Annual entertainment affairs featured the summer months' activities of the Purchasing Agents Association of Washington, beginning with the association picnic on July 24. The party was held at Gaffney's Lake Wilderness, and featured all types of games, races, contests and special events. Arthur Erickson was chairman of the committee in charge.

The annual golf tournament was held at the Rainier Golf Club on Friday, August 6. Two handsome trophies and numerous lesser prizes were awarded to winners at a dinner following the golf games. Jack Lichtenwalner was chairman. John Leptich, chairman of the bowling committee, has announced that they have reserved alleys in Seattle for the coming season for use on Tuesday evenings by Association members.

Announcement has been made of the plant visit to the Kaiser Aluminum Rolling Mill. The visit will be held in conjunction with the Spokane Group's "Manufacturers Meeting" and the University of Washington vs. Washington State College football game, to be held at Pullman, Wash. on October 16.

KANSAS CITY ASSOCIATION INSTALLS NEW OFFICERS

Installed at a recent meeting of the Purchasing Agents Association of Kansas City were the following new officers: H. F. Kirkpatrick, Marsh Steel Corporation, president; A. H. Cromb, Cromb & Gagel, Inc., and A. W. Sturges, Gleaner Harvester Corporation, vice-presidents; Fulton Monsees, Standard Steel Works, treasurer; H. L. Aker, Kansas City Life Insurance Company, secretary, and Matt Shields, Gustin-Bacon Manufacturing Company, national director. G. E. Spencer of the Faeth Company retires as national director.

(Please turn to page 278)

take a tip from me —

**YOU CAN INCREASE YOUR
PRODUCTION AND DECREASE
YOUR COSTS TOO
WITH **TANTUNG!****

®

Tantung, the most modern non-ferrous cast alloy, was specifically designed to fill the gap between conventional high speed tools and cemented carbides. Combining exceptionally high transverse rupture strength with a very high red hardness, Tantung can perform under heavier loads and higher speeds than are recommended for high speed steels.

In actual performance tests Company A reports:

"In facing a 3 $\frac{3}{4}$ " malleable iron casting on a J & L Turret Lathe, Tantung doubled the speed and feed over high speed steel, and increased production from 30 to 90 pieces per day!"

In another test Company B reports:

"We had contemplated purchasing new machines in an effort to increase production, but . . . on testing a complete Tantung tool set-up, production was tripled and the new equipment orders were cancelled."

In these and in thousands of other actual



performance tests, Tantung has proven its superiority over conventional cutting tools.

Try Tantung on your troublesome and costly production problems today. Simply write or call your nearest V-R Field Engineer for courteous, experienced help in applying Tantung to your machining problems. Remember . . . there is always an effective and economical solution to any tooling problem with Tantung.



VASCOLOY-RAMET CORPORATION

**WAUKEGAN
ILLINOIS**

District Sales and Service in Principal Cities

An affiliate of The Fansteel Metallurgical Corporation and The Vanadium Alloys Steel Company

2

NEW WILLSON MONO Goggles



Newly styled plastic eye protection with choice of curved or flat lenses offer new features designed to add to their already predominant popularity. The WILLSON MONOGOGGLE, just over an ounce in weight, is the answer to getting safety equipment worn on many hazardous jobs.

- The new flat lens design retains all the safety features of the curved lens.
- Both provide ample room for wearing of prescription glasses in comfort. The flat style, however, provides additional clearance for molded spectacle frames.
- New drop-eye shape gives wider vision.
- Greater ventilation area provides better air circulation and more wearer comfort.
- Both new designs available in clear acetate frames or the new flexible, mottled-brown, polythene frame.



WILLSON*

For complete information on these products and their application, as well as other eye and respiratory protective devices, get in touch with your Willson distributor or write us direct.

*T. M. Reg. U. S. Pat. Off.

WILLSON PRODUCTS, INC., 213 WASHINGTON STREET, READING, PA.

FIFTH ANNUAL CONFERENCE OF 7TH DISTRICT TO BE IN NEW ORLEANS OCTOBER 18TH

The fifth annual conference of the Seventh District of the National Association of Purchasing Agents will be held in New Orleans, La., on October 18 and 19. Headquarters will be in the Roosevelt Hotel. Stanley L. Mayo, purchasing agent of Freeport Sulphur Company, is general chairman of the conference. Program chairman is James J. Morse, New Orleans Public Service.

Other chairmen are as follows: banquet and entertainment: Theo Harvey, Theo H. Harvey Press; finance: Arthur Hass, Madison Lumber Company; golf committee: P. H. Dillon, P. H. Dillon and Company; hotel committee: Thomas Born, Freeport Sulphur Company; plant visitation: N. J. Gubler, Johns-Manville Products Corp.; ladies entertainment committee: George Gabler; publicity committee: John L. Dastugue, The Times-Picayune Publishing Co.; reception committee: Walter Eagen, Brook Tarpaulin Company; registration: Frank Basile, The National Bank of Commerce; registration (local): Edw. H. Loubat, American Heating and Plumbing Company; transportation: R. H. Garrot, United Fruit Company.



AIR CONDITIONING SUBJECT AT KALAMAZOO ASSOCIATION

The regular noon meeting of the Purchasing Agents Association of Kalamazoo was held at the Columbia Hotel, Kalamazoo, Mich., on August 12. Featured speaker was R. P. Jones, of the Chrysler Corporation, whose subject was "Air Conditioning—Yesterday, Today and Tomorrow". Nick A. Vanderbeek was chairman of the meeting.



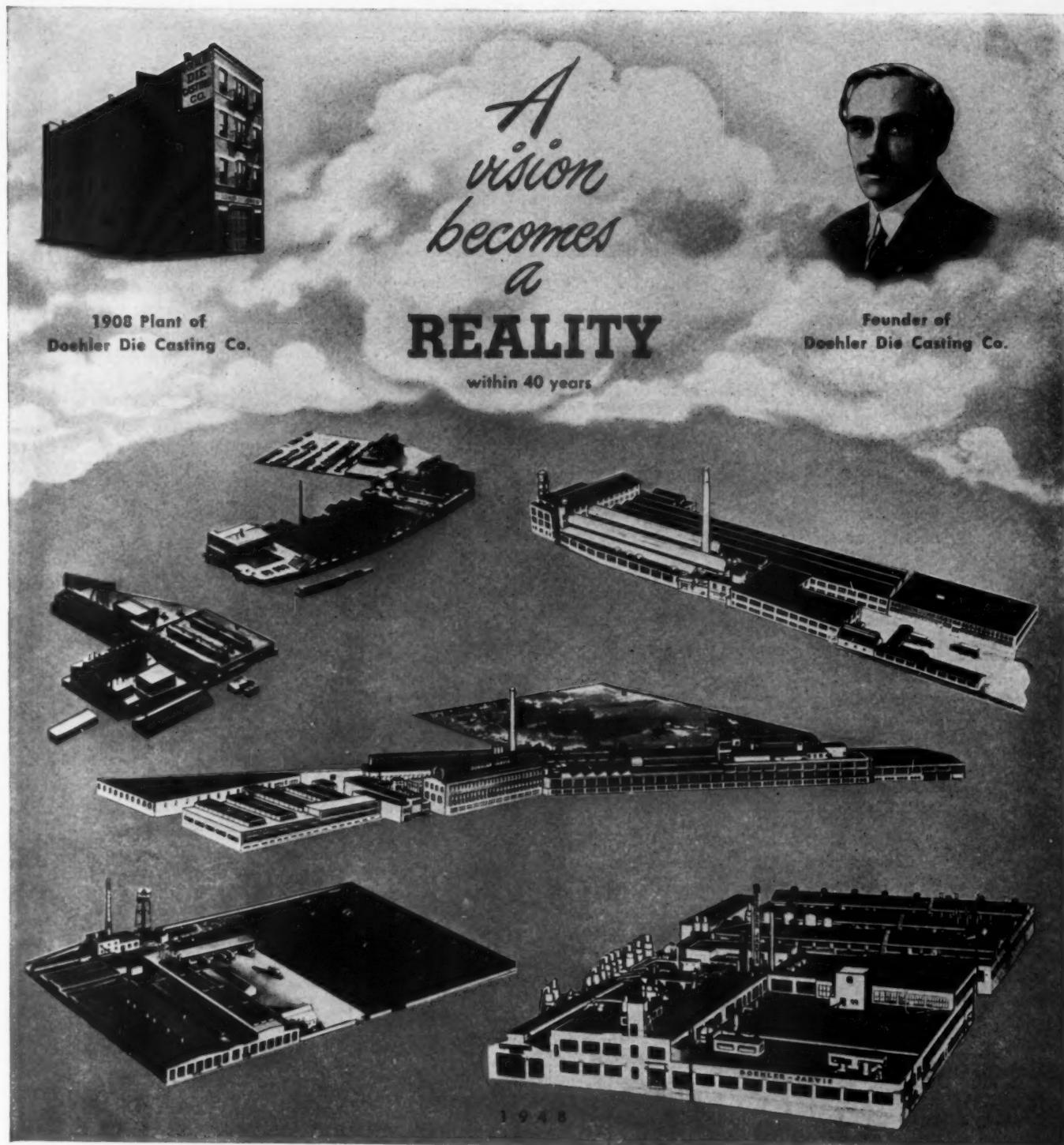
BALTIMORE PRODUCTS EXHIBIT TO BE HELD OCTOBER 26-28

The eighth annual Manufacturers' Products Exhibit sponsored by the Purchasing Agents Association of Baltimore will be held October 26, 27 and 28 at the Lord Baltimore Hotel.

Numerous booths will display the latest in mill, factory and office equipment, some of which will be shown in action. A feature of the exhibit will be the awarding of prizes for the most informative, the most attractive and the most decorative booths. The annual exhibitors' breakfast will be held on Wednesday, October 27, at which a prominent guest speaker will discuss present conditions.

Committee members and officials are as follows: general chairman, S. J. Buschmann, Stark Electric Co.; vice-chairmen, John J. Schwarz, Maryland Trust Co. and W. A. Johnson, The Balmar Corp.; attendance, L. I. Whiteford, Maryland Glass Corp. and J. Frank Smith, Baltimore Contractors, Inc.; booth reservations, Anthony J. Peroutka, Federal Reserve Bank; traffic, Morton S. Busick, Lord

(Please turn to page 280)



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SPECIAL ALLOY

to Cut
Production Costs

FOR longer service in a power machine blade the GRIFFIN SPECIAL ALLOY is your best buy. Molybdenum high speed steel, with strong, accurate raker-set teeth. Made also in hand frame sizes.

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For cutting hard alloys pick the GRIFFIN HIGH SPEED STEEL blade; power and hand

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New
TOOL HOLDERS
MAKE MORE PROFIT ON
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With ARMSTRONG TOOL HOLDERS you can take advantage of the new high speeds and heavier feeds of the newer cutting materials, without revolutionary changes or costly experimentation. They are the most profitable tools obtainable; the lowest in initial cost, the longest in service and most economical in use, for all incorporate the basic Armstrong Principle of small interchangeable cutter-bits in permanent drop forged shanks. They are the most readily obtainable tools too, for they are stocked by all leading distributors.

Write for circulars describing:

- (1) ARMSTRONG Carbide TOOL HOLDERS and ARMIDE (Carbide Tipped) Cutters.
- (2) ARMSTRONG C A TOOL HOLDERS and ARMALOY (Cast Alloy) Cutter-bits.

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

5203 W. Armstrong Ave., Chicago 30, U.S.A.
New York San Francisco

(Continued from page 278)

Baltimore Hotel, Francis X. Gaeng, The Slaysman Co., and Joseph B. Homsher, Penna. Water & Power Co.; breakfast, A. H. Schultz, Jr., Revere Copper and Brass, Inc., and John H. Crowther, H. E. Crook, Co., Inc.

KALAMAZOO ASSOCIATION DISCUSSES "PURCHASING"

A regular meeting of the Kalamazoo Purchasing Agents was held at the Columbia Hotel, Kalamazoo, Mich., on July 15. The meeting featured a discussion on Stuart Heinritz' new book "Purchasing". J. L. MacDonald led the discussion.

AIM FOR COMPLETE DISPOSAL OF SURPLUS PERSONAL PROPERTY BY END OF 1948

War Assets Administrator Jess Larson told his regional directors today to complete disposal of their surplus personal property inventories by the end of 1948 and put their houses in order to go out of business by February 28, 1949.

Mr. Larson, in mapping a campaign for liquidation of War Assets Administration in the next seven months, called for an orderly wind-up of history's greatest merchandising venture—the disposal by sale, lease, donation and scrap of 28 billion dollars' worth of left-over war supplies.

He outlined five objectives for accomplishment by February 28, 1949:

1. To dispose of all surplus personal property by December 31, 1948;
2. To dispose of all aircraft components and parts by February 28, 1949;
3. To make the maximum possible reduction in inventory of real property by the disposal of not less than 50 percent of current inventory by February 28, 1949;
4. To complete the reconciliation of records by January 31, 1949;
5. To make the maximum possible reduction in expenses of operation so that the government will receive the greatest possible net return from property disposed of.

The Administrator emphasized that recent Congressional legislation called a halt to further declarations of surplus property to WAA by other governmental agencies as of June 30, 1948, and provided for the abolishment of WAA by February 28, 1949.

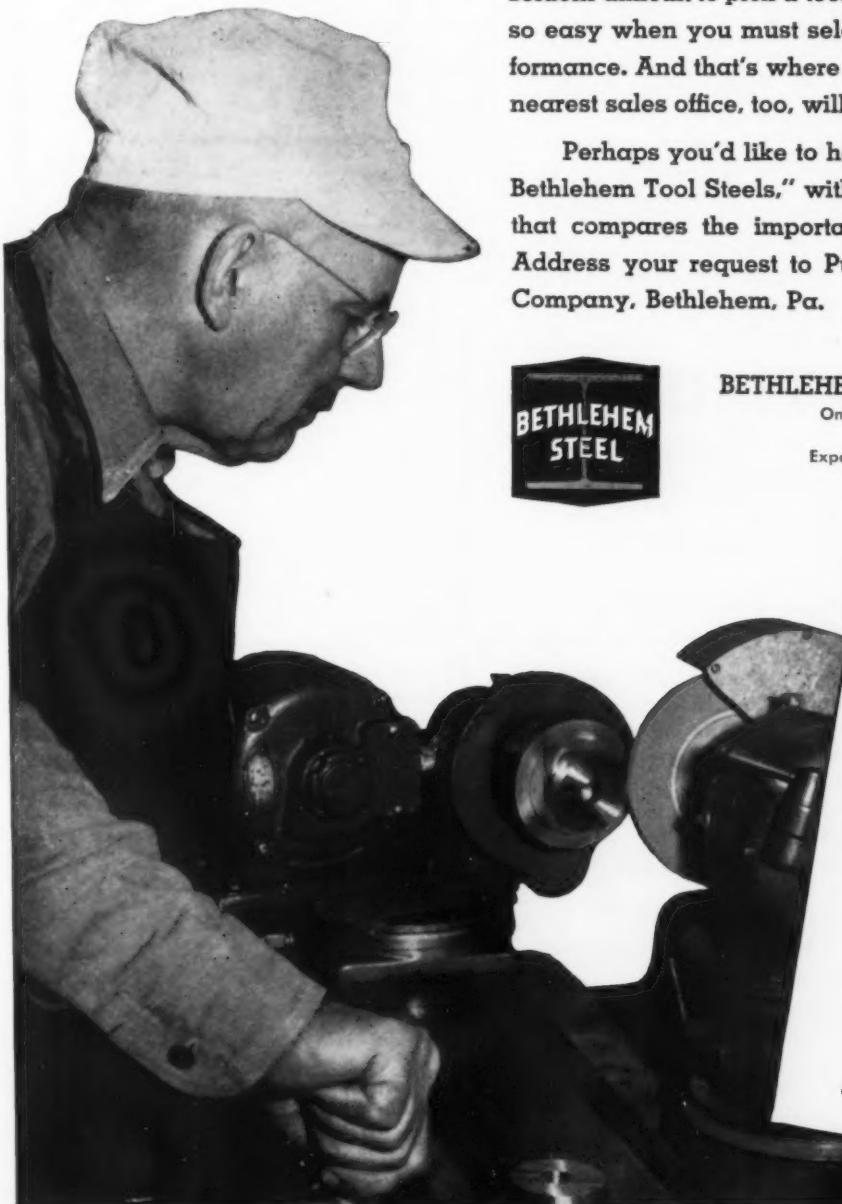
As of July 1, 1948, surplus property originally costing \$5,400,000,000 remained in WAA inventory. Of this, real property represented \$4,200,000,000 including about \$1,000,000,000 on lease; personal property \$475,000,000, and aircraft and aircraft components \$760,000,000. Surplus property costing more than \$23,000,000,000 already has been disposed of.

Congress, in addition to halting further declarations, called for the discontinuance on August 31, 1948, of priorities and preferences for Federal Agencies, veterans, state and local governments and their instrumentalities, non-profit institutions and

(Please turn to page 282)

Bethlehem Tool Steels FOR EVERY JOB

Grinding bevel edges on a die in the tool room of Victor Industries Corporation of California, Chico, Calif. Bethlehem tool steels are used here for the punches and dies used to extrude collapsible aluminum tubes.



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
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8 TOOL STEELS
for 90% of All Tool and Die Jobs

CARBON AND CARBON-VANADIUM
General-purpose, water-hardening
BTR (Bethlehem Tool Room)
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A-H5 (5 pct Chrome Air-Hardening)
Increased wear, safer-hardening (air)
LEHIGH H (high-carbon, high chrome)
Maximum wear, minimum distortion in
hardening (air)

OMEGA
Shock-resisting, for cold-battering tools
67 CHISEL
For general-purpose shock tools
SPECIAL HIGH-SPEED
18-4-1 composition for general use
66 HIGH-SPEED
6-5-4-2 composition (low tungsten, moly)

Travelogue for travelers...

FOR THE RAILROAD OF THE FUTURE ?



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When, and if, railroad passengers can watch colored slides depicting the region through which they pass, the reproduction unit will probably be made better and more economically with the aid of plastics... and Auburn plastics engineers will help decide their application.

For today's molded plastics... as well as the future's... Auburn's research, experience and facilities in molding plastics is your guarantee of complete satisfaction when you choose Auburn as your custom molder. Auburn Button Works, Inc., 300 McMaster St., Auburn, N.Y.



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MOLD MARK

Auburn Button Works, Inc.
MOLDERS SINCE 1876
AUBURN, NEW YORK

Offices: New York and Chicago, Representatives: New England, Philadelphia, Cleveland, Detroit, San Francisco

(Continued from page 280)
others in the purchase of surplus personal property. Granting of discounts for public health and educational purposes also will be discontinued.

"With the halting of further declarations and ending of the time-consuming priority system," Mr. Larson said, "we should be out of the personal property business by the end of the year and have our records and bookkeeping in the best possible order by January 31, 1949."

Mr. Larson pointed out that many obligations in the disposal of surplus personal property, resulting from provisions of the Surplus Property Act or other legislation, but often confused with priorities and preferences, will remain effective after August 31, 1948.

For example, he said, the needs of the Armed Forces are placed by the Act above priorities and preferences and remain paramount. WAA still is charged with the duty of facilitating transfers to other government agencies to the fullest possible extent.

Under Public Law 97, the Federal Works Agency may obtain equipment and supplies for institutions engaged in the training of veterans. Donations will continue under Section 13(b) of the Act. Consideration will be given to small businesses in programming, lotting, offering, and advertising in such a manner that they may participate.

After August 31, 1948, Administrator Larson said, competitive bid methods of sale will be used exclusively for public

(Please turn to page 284)

INDUSTRIAL FINISHES

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• ENAMELS

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• SYNTHETICS

Approved Government Specifications

You can't beat Alaka's experience when it comes to finishes. Alaka has tailor-made more than 10,000 different industrial finishes. Alaka's research department has amassed a maximum of experience and facility to help you, whatever your finishing problem.

ALAKA Lacquers

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222 FORTIETH ST., BROOKLYN 32, N.Y.

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SHEET INSPECTION
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HEAT MARKING
with Pannier
"MASTER MARKER"**

**HEAVY DUTY
STAMPS**

Bolt Handle Flat Stamp

Double-Head Hammer-Style

National Rubber Type—easy to insert, without springs or wires, yet can't fall out or shake loose. "A Pinch and it's in."

Identifying data is quickly and easily marked on your sheet mill products with these rugged Pannier "Master Marker" Stamps. Two of the many convenient, efficient styles offered by Pannier for this purpose; they have detachable brass-back rubber dies with shock-absorbing rubber bases; are available with or without mortises to hold Pannier National Interchangeable Rubber Type; and produce clean, sharp, readable markings. Dies are made in almost any required design. By proper choice of Pannier "Master Marker" Ink, printed design can have the exact properties to suit your product and manufacturing conditions.

See these and other advanced Pannier Marking Devices at Booths 252 and 253, Iron and Steel Exposition, Cleveland, Ohio, Sept. 28-Oct. 1. Or write for complete details.

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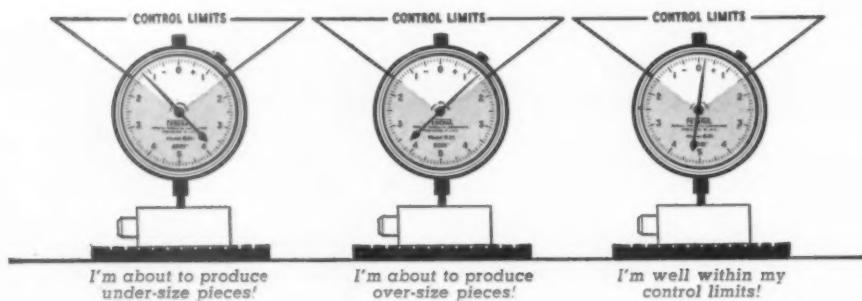
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Warning!

It's time for new eyes in your production line—to make the work come through right the first time—to let your workers see what they're making—to adjust machines before they produce scrap.



Dial Indicator Gages tell the mechanic what he wants to know. They show him whether the part is too large or too small; they also show him exactly how much the workpiece is off standard. He gets an accurate reading at a glance; he saves time; he no longer relies on the sense of "feel."

Furthermore, and most important, the Dial Indicator tells the operator exactly how much the work is tending toward the high or low limit. Hence, he knows how much or how far to readjust the setting of the machine.

When control limits are set up on a Dial Indicator, the machine's tendency to exceed these limits is quickly spotted; the machine is adjusted before the scrap is produced.

The continued use of Quality Control methods leads to sensible standardizations in product, specifications, machine methods and materials . . . Let us give you case histories.

Dial Indicators can be applied to the gaging of any linear dimension. We make both regular and custom-built gages to meet the needs of users in hundreds of industries. For highly specialized needs, we also make Air Gages and Automatic Electronic Sorting Gages. Let us help you with any problem of gaging and inspection. If you will send us blueprints of work to be measured, we will gladly recommend the proper gage. No obligation is involved.



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1144 Eddy St., Providence 1, R. I.



YOUR PROFIT DECISION IS *Visible** PRECISION

* The use of Dial Indicator Gages—visible precision—lowers inspection costs, raises production. Federal Products Corporation is America's largest maker of both regular and custom-built gages—mechanical, air, electronic—for the measurement of single and multiple dimensions.

Represented in Canada by Rudel Machinery Company, Ltd.

(Continued from page 282)

offerings of personal property. Programs are being developed to permit Federal Agencies, state and local governments and their instrumentalities to participate in competitive bid offerings.

Surplus aircraft components will continue to be sold through Industry Agents, Mr. Larson said. It is estimated that agents' inventories will be approximately \$150,000,000, acquisition cost, by December 31. It is contemplated that this material will be sold to the agents or other purchasers before February 28, 1949.

Regional inventories of personal property as of June 30 are as follows: Chicago—\$114,884,000; Cincinnati—\$81,945,000; New York—\$98,430,000; Philadelphia—\$67,851,000; Atlanta—\$15,920,000; Grand Prairie—\$21,822,000; Kansas City—\$21,735,000; San Francisco—\$19,727,000; Denver—\$4,487,000, and Seattle—\$9,108,000.



YALE CATALOGS COMPLETE LINE OF "WALKIES"

A new three-color, 30-page bulletin has been issued by Yale & Towne on their complete line of Worksaver electric trucks. The trucks, known as "walkies", are battery-powered hand trucks combining the lightweight and maneuverability of the hand truck with the electric-lift and electric-motivation features of the ridden truck.

The bulletin describes and illustrates each of the seven trucks and the mechanisms basic to all different types. Recommended uses, capacity, weight, battery characteristics, speeds, dimensions, electrical characteristics, mechanical and general characteristics are given for each type. Shown also are photographs of the various uses of Worksavers on jobs such as handling cinder block, paper, steel, skid-bins, pallet bins, crates, cores, rubber, etc.

The catalog may be obtained by writing The Yale & Towne Manufacturing Company, 4530 Tacony Street, Philadelphia 24, Pa., and asking for Bulletin P809.



COAL INDUSTRY TO DEVELOP CONTINUOUS MINING MACHINE

The bituminous coal industry recently launched a \$250,000 engineering program to design a machine that will mine coal cheaper and faster. The program's ultimate objective is a machine that will both cut coal "off the solid" without the use of explosives and load the coal continuously onto a conveyor or into mine cars.

The project marks another effort of the coal industry to provide a saving in cost of fuel to the ultimate consumer. The industry is fighting to maintain coal's competitive balance of favor among fuels by more economical mining. The coal producing companies are supplying the major financial backing of the project, supported by four coal-carrying railroads and ten coal land companies. It is the desire to develop a machine that will mine coal in seams of varying thickness and as low as 28 inches.

(Please turn to page 286)

NOTICE

PHOTACT

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PHOTACT is a K&E trademark that is registered in the United States Patent Office. It is the name given by KEUFFEL & ESSER CO., for the

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customers, to certain papers and cloths and a developer and a fixer for making reproductions. The name PHOTACT may be properly used only in connection with genuine K&E products.

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INCREASE
YOUR
CUTTING
BETTER THAN
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with **MILFORD**
WAVY SET
BAND SAW BLADES

YOUR OWN
MACHINES
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BEST PROVING
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TEST A
MILFORD
WAVY SET
BLADE
against the
field!



Now individually
packed in cartons
for ease in handling

Yes . . . it's true . . . enthusiastic users tell us that 30% increased production on horizontal and vertical cut-off band saw machines is conservative.

These blades of unique design eliminate ripping of teeth . . . and cut with greater precision and closer tolerance. One pitch, 10-tooth blades can be used for cutting bar stock, angles and pipe.

Available in the $\frac{3}{4}$ " 10 and 12-tooth sizes for immediate shipment.

Your Industrial Supply Distributors are always ready to serve your needs for all factory and mill supplies as well as **MILFORD WAVY-SET** and other blades. Order through them.

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PROFILE AND
BAND SAW BLADES
BAR STOCK AND CUPPERS
HACK SAW BLADES

THE HENRY G. THOMPSON & SON CO.

Saw Specialists Exclusively for Over 70 Years
NEW HAVEN 5, CONNECTICUT, U. S. A.

RAPID STANDARDS CO. ADOPTS RAPISTAN AS TRADEMARK

The Rapid-Standard Co., Inc., material handling equipment manufacturers of Grand Rapids, Mich., announce the adoption of the term "RapiStan" as a trademark to designate all equipment manufactured by it.

1 1 1

BORING MACHINE DESIGNED FOR CEMENTED CARBIDE BORING BARS

What is believed to be the first standard precision boring machine designed specifically for the use of Carboloy cemented carbide boring bars, is announced by Hoern & Dilts, Inc., Saginaw, Mich. The new Model 10-5 is a five station, ten spindle machine with a Carboloy boring bar for each work spindle. Standard carbide boring bits are inserted in each carbide boring bar.

The head of the machine is pentagonal, each side carrying two boring bars. In operation the head and work table revolve continuously. The production rate ranges



The Hoern & Dilts 5 station 10-spindle high precision boring machine uses carbide tools and Carboloy boring bars.

from 1400 pieces per hour for pieces having a depth-to-diameter ratio of 6 to 1, to 800 pieces per hour for guides bored from each end. Carbide tools also chamfer the guide on the OD while the ID is being precision bored.

Chief advantage of the Carboloy boring bars is their ability to bore parts of greater lengths-to-diameter ratios with greater accuracy. This is possible because high rigidity of the carbide bar (2.8 times that of steel) greatly reduces both deflection and 'wind-up'.

1 1 1

AIR-POWERED GENERATOR

A light-weight air-powered generator, known as the Airlite, has been introduced by the Ingersoll-Rand Company, 11 Broadway, New York, N. Y. The unit will supply ample power to operate two 75-watt, 115 volt bulbs. It is stated that the Airlite cannot be harmed by short circuits or overloads, that if the output terminals are directly shorted, light is restored the instant the short is removed. The AL-150 Airlite weighs $8\frac{3}{4}$ lbs., and measures $7\frac{1}{4}$ " x 5" x 5" without handle. The unit is available in 115 volt and 220 volt models.

(Please turn to page 288)

NOW GLOBE WELDING FITTINGS



...produced
from Globe Steel
Tubes by the Globe
precision process

When you specify and use Globe Welding Fittings you will have the product of an organization with unusually broad metallurgical experience. Globe's precision-process method of production reaches back to the manufacture of the Globe seamless tubes themselves which are the "raw material" of Globe welding fitting fabrication.

Send for the Globe Welding Fittings Catalog—and look to Globe as a preferred source of supply.



GLOBE STEEL TUBES CO.
Milwaukee 4, Wisconsin

Producers of Globe seamless—carbon—alloy—stainless steel tubes—Gloweld welded stainless steel tubes—Globeiron seamless high purity ingot iron tubes.

GLOBE
PRECISION PROCESS
WELDING FITTINGS

"Good Cutting Oils Sure Keep You Out of Trouble"

...says
"CHIP" WRIGHT

"Whenever there's trouble with tools or finishes or jobs fall behind schedule, the first thing I check is the cutting fluid, because when that's not exactly right, it's surprising how it can upset the whole job. You just can't get around it, cutting oils do make a big difference . . . and it isn't smart to quit trying until you find the right one. It doesn't make sense to put up with headaches that can be avoided. That's why I think it pays to rely on experienced cutting oil people. They come up with sound, practical assistance."



Here's a Practical Tip:
For Your Toughest Jobs
Try THREDKUT

You've heard of THREDKUT and what it has accomplished on tough jobs where other oils have failed. The stabilized balance between its uniformly high anti-weld value and its other desirable cutting characteristics, make it especially efficient in the machining of tough, stringy metals . . . and for the more difficult operations such as thread cutting, tapping, broaching and gear shaping. Here's a cutting fluid that can help you. For complete information, write for the THREDKUT Booklet.

Another Time-Tested Stuart Product

**STUART oil engineering goes
with every barrel**



D. A. Stuart Oil Co.
EST. 1885

2272-31 SOUTH TROY STREET, CHICAGO 23, ILL.

ELECTRICAL WIRE HAS SLIPPERY FINISH

A new slippery finish for electrical wire has been developed by United States Rubber Company to make the wire pull more easily through sharp bends in conduit.

The super-slippery surface is produced by a new wax coating on the insulation which is said to make the wire slide with one-half or one-third the amount of pulling formerly required.

The wax is used on U. S. Rubber's Laytex wire, widely employed in homes and commercial buildings. It is expected to speed up the installation of electrical equipment, particularly in locations difficult of access and where sharp-angle conduit is employed in the electrical system.

1 1 1

NEW INSULATOR INCREASES FREEZER CAPACITY

A new insulating tool that increases freezer capacity without increasing bulk and at the same time insures lower, more uniform temperatures for longer periods of time is announced by Monsanto Chemical Co., Everett, Mass. The new tool is Santocel, a free-flowing powder. A silica aerogel, Santocel in a two-inch installation as against the normal four-inch insulation, increased the capacity of a four-cubic-feet freezer to 7.25 cubic feet. Insulating factors remained the same, i.e., Santocel maintained the same efficiency as the previous

(Please turn to page 290)

**"DIE-LESS"
DUPLICATING
SAVES MAN POWER
AND DELAYS!
DIE ACCURACY
WITHOUT DIES
Send for
CATALOG**

BENDER

SHEAR

BRAKE

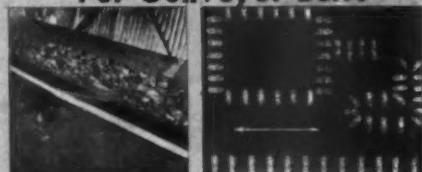

**"DIE-LESS" DUPLICATING
The DIE-LESS System of
METAL Duplicating
without Dies**

O'NEIL-IRWIN MFG. CO.
305 EIGHTH AVENUE, LAKE CITY, MINNESOTA

Present Day Practice in Belt Fastening

Every man who has anything to do with the purchase, application or maintenance of conveyor, transmission or V-belts will find the bulletins listed below of considerable value in connection with belt fastening work. A knowledge of present day practice in belt fastening helps reduce the loss in machine hours due to belt failures caused by the use of the wrong type of fastener or improper application. We shall be glad to send any or all of them to you or to any of the men in your organization.

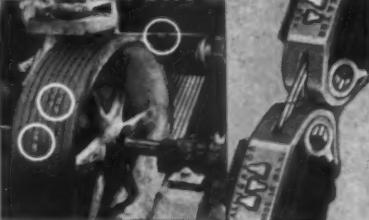
For Conveyor Belts



FLEXCO HD Belt Fasteners are used to make a "water-tight" butt joint in conveyor belts ranging from $\frac{1}{4}$ " to $1\frac{1}{2}$ " thick and of any width. The view on the right shows the various types of rips that can be repaired with these fasteners and Flexco HD Rip Plates.

Bulletin F-100 gives complete details on how to fasten and repair conveyor belts.

For V-Belts



ALLIGATOR V-Belt Fasteners are now being widely used to fasten B, C and D, open-end V-beltting of cross woven fabric core construction now being made by most belting manufacturers. The view at the left shows a typical application of these fasteners to a drive where endless V-belts would require dismantling the machinery to put the belts on the sheaves.

Bulletin V-205 gives complete instructions on how to use V-belt fasteners.

FLEX Y Fasteners for A and B belts are also available for lighter duty V-belt drives. Ask for Bulletin Y-14.

For Transmission Belts



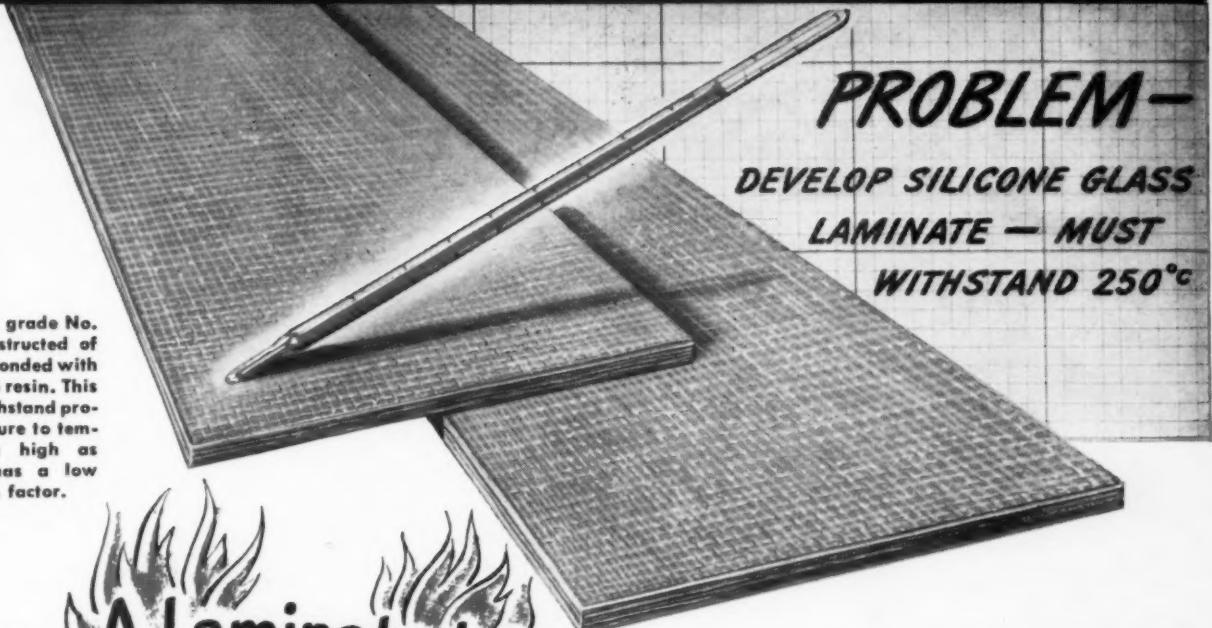
ALLIGATOR Steel Belt Lacing is in worldwide use to make smooth, flexible joints in leather, rubber, balata, stitched canvas or solid woven belts up to $\frac{1}{2}$ " thick and as wide as they come.

Bulletin A-60 tells how to fasten and repair transmission belts.

Sold by Supply Houses Everywhere

FLEXIBLE STEEL LACING COMPANY
4697 Lexington Street, Chicago 44, Ill.

MORE THAN 50 GRADES OF G-E TEXTOLITE LAMINATED PLASTICS ARE AVAILABLE



G-E Textolite grade No. 11514 is constructed of glass fabric bonded with a G-E silicone resin. This grade will withstand prolonged exposure to temperatures as high as 250°C and has a low dielectric loss factor.

Now... A Laminated Plastics that likes the HOT SPOTS

TEXTOLITE LAMINATED IS SUPPLIED
IN FIVE FORMS



SHEETS, TUBES, AND RODS
—These standard shapes are available in thousands of sizes. Up-to-date manufacturing methods facilitate quick deliveries.

FABRICATED PARTS—G.E. has modern fabricating equipment to machine Textolite laminated plastics parts to your own specifications.



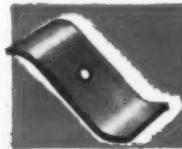
MOLDED-LAMINATED PARTS—Textolite is custom molded directly to shape. Molded laminated products are among the strongest plastics parts produced.



LOW-PRESSURE MOLDED PARTS—Extremely large and irregular Textolite shapes are custom molded by the low-pressure laminating process.



POST-FORMED LAMINATES
—Sheets of Textolite laminated plastics are custom formed into simple shapes by this very inexpensive method.



If you are looking for an excellent high-temperature insulation, G-E Textolite grade 11514 is your answer. But there are other grades of Textolite, too . . . over fifty in fact, and EACH grade has an INDIVIDUAL COMBINATION of properties. None is exactly alike.

It is this wide selection of materials that really can help you. You can choose a grade which has exactly the right properties to accurately fill your particular requirements. A better product, produced at less cost, is often the result.

Investigate the varied grades of Textolite and the five forms in which it is produced. You'll profit. Plastics Division, Chemical Department, General Electric Company, Pittsfield, Mass.

GET THE COMPLETE STORY!

Send for the new bulletin G-E TEXTOLITE LAMINATED PLASTICS which lists grades,

properties, fabricating instructions and detailed information about the five forms of Textolite. Fill in and mail the coupon below for your free copy.

PLASTICS DIVISION, CHEMICAL DEPARTMENT
GENERAL ELECTRIC COMPANY (BB-9)
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Please send me the new G-E Textolite laminated plastics bulletin.

Name.....

Firm.....

Address.....

City..... State.....

GENERAL ELECTRIC

CD48-M3

Can
You
Name
it?*



**Another name might be the
PRODUCTION CASTING
OF THE MONTH**

**SUPERIOR FOUNDRY
OF CLEVELAND, OHIO**

**will show you monthly
an outstanding example
of production castings...**

**that our modern and completely staffed
and equipped Foundry turns out regularly
for satisfied customers. They know that
it saves them time, money, and produc-
tion headaches to always bring their
casting problems to**



SUPERIOR FOUNDRY, INC.
3542 EAST 71st STREET • CLEVELAND 5, OHIO

MICHIGAN 3078

*You can take a bow if you correctly called this gray iron casting, a Meter Valve Plate.

(Continued from page 288)

insulation but nearly doubled the capacity of the freezer. An 11-foot industrial chilling unit, insulated with seven inches of Santocel operated at 150 deg. below zero with a heat loss of 210 BTU's per hour; with ordinary insulation the loss would be about twice as great. Furthermore, about 20 inches of ordinary insulation would be necessary to reduce heat losses to a point equivalent to seven inches of Santocel.

1 1 1

**PLASTIC SHEETS MADE
IN RECORD SIZE**

Large sheets (100" x 120") of acrylic plastic more than twice the size of any plastic sheets formerly available are now in commercial production by Rohm & Haas Company, manufacturer of Plexiglas. The new development widens the scope of designs based on plastics and makes possible the use of a plastic in many large-dimension applications not previously possible.



83-ft. square sheet of acrylic plastic,
crystal clear and shatter resistant

Initial non-military demands for the large sheets have been made by the automotive industry for forming into curved transparent tops to be featured as accessory equipment on new convertible models; merchandising men for making mammoth one-piece showcases; and in architecture, where the material is expected to find wide use in applications such as partitions, wall-facings, facades and curved glazing.

The sheets are being produced at the manufacturer's Knoxville, Tenn. plant, and are available in limited quantities, in quarter-inch to half-inch thicknesses. It is expected that with expanded production the sheets will also be offered in corrugated form.

1 1 1

FURNITURE PACKAGING

The new Kimpak Product Fact Sheet File on Furniture Packaging, just issued by Kimberly-Clark Corporation, Neenah, Wis., contains 12 data sheets covering the application of Kimpak creped wadding for surface protection and padding of many types of furniture for shipment by rail as required or recommended in the new Supplement 45 to Consolidated Freight Classification 17.

(Pleaseing turn to page 292)



BUSHINGS

PRECISION BRONZE BARS

BRONZE BEARINGS

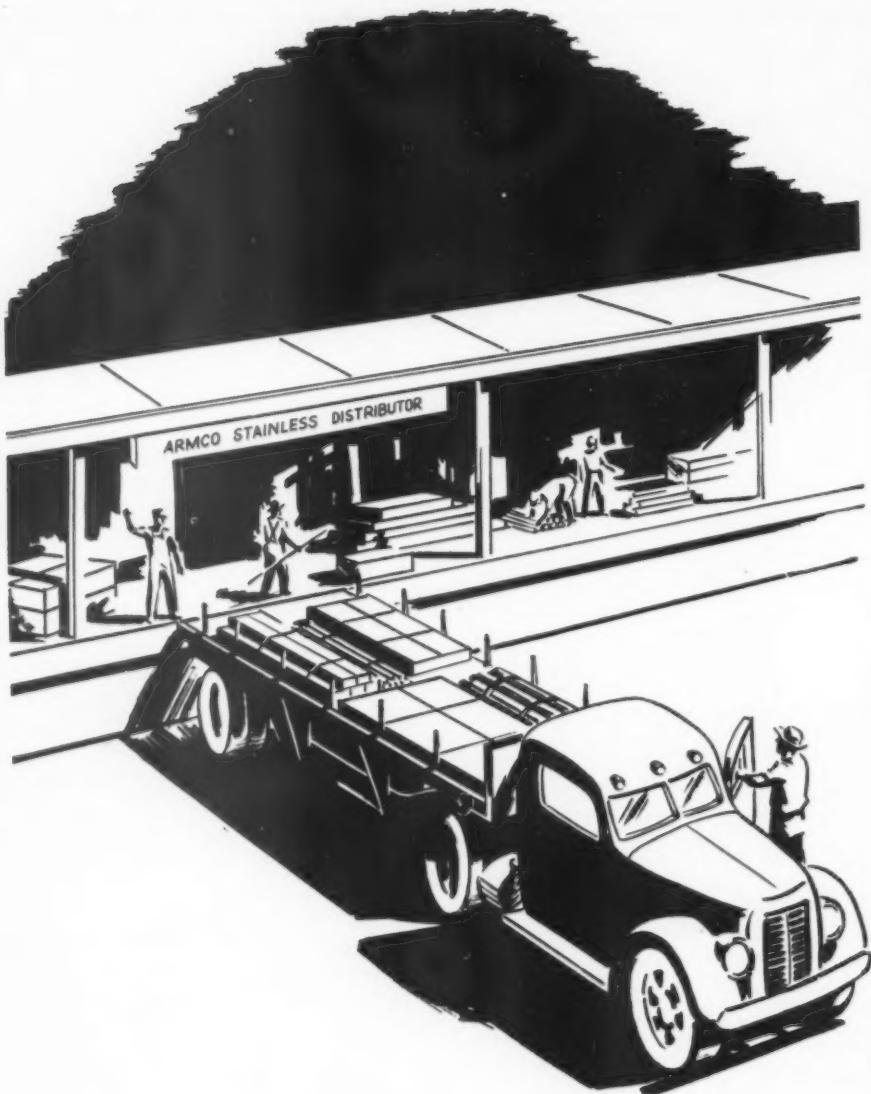
The sleeve bearing insures—

1. Low Initial Cost
2. Low Cost of Housing Design
3. Low Cost of Installation
4. Low Cost of Maintenance

Bunting Engineers can assist you in designing for over-all economy. The Bunting Brass & Bronze Co., Toledo 9, Ohio. Branches in Principal Cities.

Bunting

66



YOUR STAINLESS STOCKS can be miles away from "home"!

When your production men put in a hurry-call for stainless steel, remember your nearest ARMCO Stainless Steel Distributor is ready to give you instant service.

This means three important advantages for you. 1. You tie up less money in inventory; 2. save valuable storage space, and 3. obtain the services of an experienced metallurgical consultant.

Your Armco Distributor can give you *complete* stainless steel service too. He stocks popular types of ARMCO Stainless Steel sheets, bars,

plates, angles, and fasteners.

More than likely he can ship your order the same day. If you need special grades he can obtain them for you quickly.

Next time you need stainless steels call the Armco Distributor nearest your plant. You'll find he can give you prompt, helpful service. If you don't know his name write or wire Armco Steel Corporation, 200 Curtis Street, Middletown, Ohio. We'll be glad to give you the information you need.

Export: The Armco International Corporation



ARMCO DISTRIBUTORS

STANDARDS OF VERY SMALL CAPACITANCE

In response to requests from manufacturers and users of electron tubes, the National Bureau of Standards, Washington, D. C., has established standards and equipment for testing and certifying small fixed standards of capacitance ranging in value from 100 down to 0.001 micromicrofarads. This work, under the direction of Dr. Charles Moon, has involved the development of a series of primary reference standards and the construction of several fixed secondary standards and variable capacitors. For values below 0.1 μf , a new type of primary standard capacitor has been designed, utilizing a principle which makes practical the construction of units having a capacitance as small as may be desired.

FLUORESCENT PLASTIC IS SELF-ILLUMINATING

Signs with self-illuminating lettering, decorative panels with edges and surface designs that glow brilliantly under their own power, and dials, pointers, nameplates and such which must attract and hold extra attention—these are some of the uses being made of a new fluorescent form of acrylic plastic just introduced by Rohm & Haas Company, Philadelphia, Pa.



One of the first signs made with the fluorescent plastic material.

Called Daylight Fluorescent Plexiglas, the material has been described as having "built-in edge-lighting", since exposure of the plastic to daylight or normal room illumination results in edge-lighted effects ordinarily obtained by directing light into the edge of acrylic material.

The phenomenon is caused by millions of fluorescent dye particles with which the plastic is impregnated during manufacture. Each particle of dye, when struck by light rays entering the fluorescent sheet, reflects the light in all directions. Most of the reflected rays are trapped within the polished sheet and travel through it by repeated interior-surface reflections to the edges, where they escape in a high concentration of fluorescent light. Similarly, letters and designs carved into or painted on one surface of the sheet are outlined in the same brilliant color that characterizes the edges.

In addition to indoor signs, panels and dials, large individual block and script letters can be formed from the material.

(Please turn to page 294)

**IT'S HARPER
EVERLASTING
FASTENINGS**

~~10~~¹¹ **TO 1**

**OVER
COMMON STEEL!**



Everlasting Fastenings

Resistance to Rust and Corrosion

Attractive Appearance

Resistance to High Temperatures

Easy to Clean

Non-Magnetic

High Strength

Non-Sparking

Long Service

Re-Usable

Lower Ultimate Cost

Resistance to Fatigue

Common Steel—Lower First Cost

PROMPT SHIPMENT FROM STOCK. Bolts, Nuts, Screws, Washers, Rivets and Accessory Items in Brass, Bronzes, Copper, Monel, Stainless. Harper maintains stocks of over 5,000 different items in Chicago and New York... large quantities of each. Others being added constantly. Specials made to order from ample stocks of raw materials. Write for catalog.

THE H. M. HARPER COMPANY
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MUSIC Spring Wire



Uniform by all the measurements of quality spring wire. Rigid control of chemical composition and processing methods assure its uniformity and structural soundness. Our specialized coiling, twist and bend tests are added safeguards of dependability.

You can depend on Keystone Music Spring Wire — as well as our other manufacturers' wires — to satisfy your most exacting requirements.

KEYSTONE STEEL & WIRE COMPANY
PEORIA 7, ILLINOIS

(Continued from page 292)

Shaped from fluorescent strips and mounted to present a single glowing edge to an observer, or formed from large sheets so that a double outline is in view, such letters have the appearance of lighted neon tubing. A background panel of clear transparent Plexiglas gives a striking suspended-in-air effect to such letters.

The degree of fluorescence in edges and surface markings is proportional to the area of the plastic, and is therefore increased when large, rather than small, sheets are used. If the edges are covered with a reflecting material, such as foil, white lacquer or aluminum, the brilliance of surface designs will be intensified.

Daylight Fluorescent Plexiglas is shatter-resistant, light in weight, can be formed by methods applicable to standard acrylic sheeting, and is worked and machined like woods and soft metals. It is supplied at present in red and green colors, with other fluorescent hues being investigated by the manufacturer. Available in standard size sheets up to 36" x 60" and in thicknesses of .060", .125", .187" and .250".

1 1 1 NEW TYPE SKID DUMP



The accompanying illustration shows new Model MF-L "skid dump" announced by the Phillips Mine & Mill Supply Co., 2227 Jane St., Pittsburgh, Pa., for handling heavy loads of scrap, castings and other industrial materials. This dumping unit is easily handled with either platform or fork lift trucks. Its capacity is 24.1 cu. ft. or .9 cu. yd. full; with a 6 in. surcharge, the capacity is 30.25 cu. ft. or 1.11 cu. yards. The hopper is fabricated of 3/16 in. steel plate with smooth rolled edges.

1 1 1 WORLD FIBER PRODUCTION AT PREWAR LEVELS IN 1950

World fiber production will not be up to prewar levels until 1950 and as a result, cordage producers throughout the world will be on a limited production basis for the next two years. This is the opinion of Earl E. Bockstedt, vice-president of the Columbia Rope Company, who recently arrived by Pan American Clipper at La Guardia Airport, New York, after a three-months' tour of the Philippines, Netherland East Indies and India.

Mr. Bockstedt visited these major fiber producing countries to determine how the

(Please turn to page 296)

BACK IN THE 1880'S

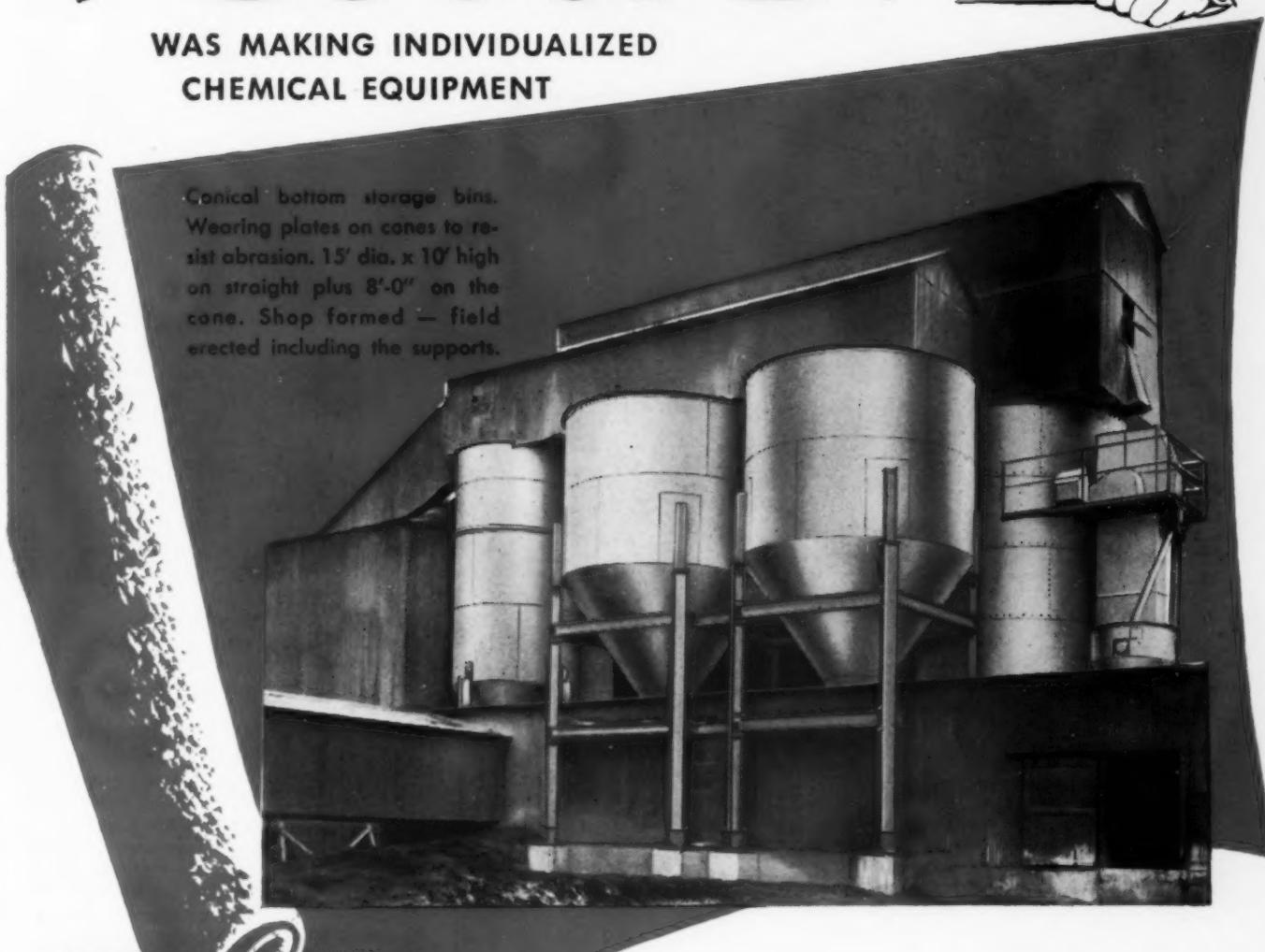
WHEN PASTEUR
DEVELOPED VACCINE

Koven

WAS MAKING INDIVIDUALIZED
CHEMICAL EQUIPMENT



Conical bottom storage bins.
Wearing plates on cones to re-
sist abrasion. 15' dia. x 10' high
on straight plus 8'-0" on the
cone. Shop formed — field
erected including the supports.



KOVEN traces its history back to the epic eighties, when science and industry were making tremendous forward strides. In its own field of equipment manufacture, KOVEN fabricated individualized chemical units outstanding for economical, dependable service. In our two huge plants, we have every facility for producing equipment to your exact requirements: complete welding and flame-cutting apparatus, sheet and plate metal shops, stress-relieving furnaces, X-ray inspection, pickling tanks for galvanizing. Call or write for a representative—no obligation.

KOVEN equipment in all commercial metals and alloys includes: pressure vessels, extractors, mixers, stills, condensers, kettles, tanks, chutes, containers, stacks, coils.

PLANTS:
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L. O. KOVEN & BRO., Inc., 154 Ogden Ave., Jersey City 7, N. J.

KOVEN FOR INDIVIDUALIZED CHEMICAL EQUIPMENT SINCE 1881

NEWARK

DESIGN
and
PRODUCTION
of
WOVEN
WIRE PARTS

NEWARK
for ACCURACY

Why not allow us to do a "from start to finish" job on your fabricated wire cloth parts? What do we propose to do? Assist you with the design, set up the necessary tooling, make the wire cloth . . . it's the well known Newark Wire Cloth long noted for its accuracy and durability . . . and do all the necessary cutting, stamping, punching, welding, soldering, seaming and bending. We deliver to you a finished product in any quantity desired. We are equipped to handle your requirements on a quantity production basis. May we quote on your next requirements?

* * *
We also manufacture a complete line of industrial wire cloth in all commercial malleable metals.

Newark
Wire Cloth
COMPANY

346 Verona Avenue

Newark 4, New Jersey

(Continued from page 294)

war and the absence of management had affected the fiber supply situation, and the prospects for the future.

"Generally speaking, the Dutch East Indies are just beginning to make significant gains in rehabilitation of sisal plantations; the Philippines are restored to about two-thirds of their prewar production level but they are having difficulties in obtaining better grades of abaca; and India, while expecting the 1948 jute crop to be the largest since the war, is still not up to the prewar average," Mr. Bockstedt said.

"Prospects for 1948 indicate that American shipping, industry and agriculture can expect more and better twines next year but there won't be any significant changes in the supply of top quality rope. Conditions in the Pacific areas promise increased supplies of jute and sisal in 1948, but production of better grades of Manila hemp will remain at about the current level. However, quantities available for the United States will be affected by the SCAP buying program and purchases by the Allied Control Commission for Germany which will require considerable fiber."

Discussing the situation in the Philippines, Mr. Bockstedt said that the government is giving lots of attention to production of abaca, or Manila hemp, the country's second most important export crop, but there are still inadequate quantities of high quality fiber. Davao Province, famous for its fine abaca, is suffering because of litigation over land ownership and indiscriminate cutting of fiber plants.

"Replanting on a wide scale, together with research to improve the quality of fiber, are essential if Davao is to remain the producer of the world's best grades of abaca," Mr. Bockstedt declared. "If this is not done," he said, "Davao may eventually lose abaca production as a profitable industry."

Customs barriers between India and Pakistan are retarding the jute trade, he continued. However, "conferences between the two countries had begun just before I left there, and I am hopeful that they will agree on modifications of trade barriers that will permit the fiber to move more freely in foreign trade channels. Plantings in March promise a record post-war crop that should result in lower jute prices in the fall. The 1948 yield is expected to be 10,000,000 bales, compared with production in 1947 of about 8,00,000 bales."

1 1 1

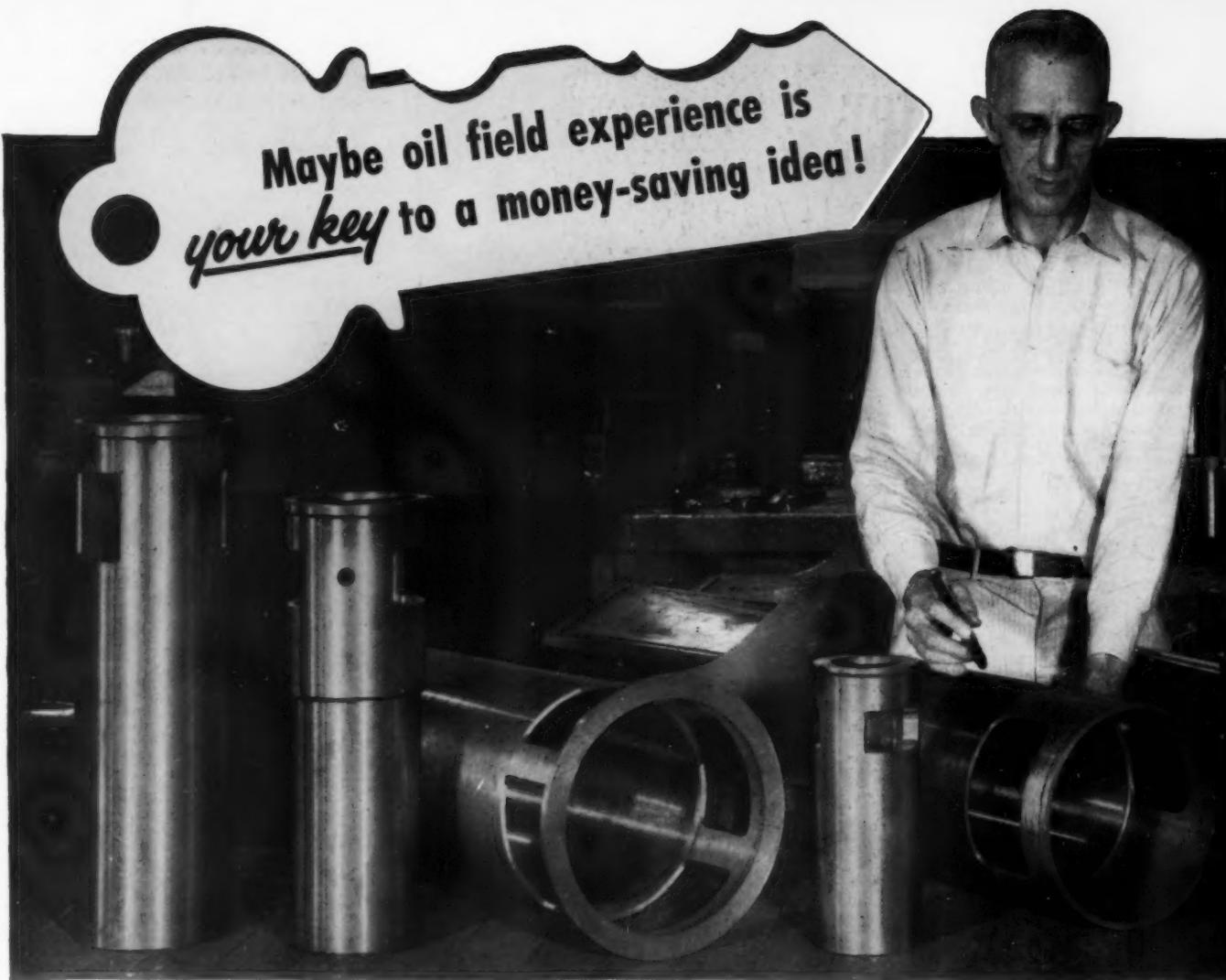
PACKAGING LITERATURE AVAILABLE

"Snapshots" of better packaging showing many items as they are actually being packed are featured in a new booklet entitled "The G. B. Container Album". This booklet illustrates several types of shipping containers designed by General Box Company packaging engineers.

These twelve pages of descriptive packaging information are offered free by writing the General Box Company, 500 North Dearborn Street, Chicago 10, Illinois.

(Please turn to page 298)

Maybe oil field experience is
your key to a money-saving idea!



THE bronze parts shown above are pump liners. Soon they'll be in tough, continuous service, mostly in the oil fields. Here, strength, wear-resistance, uniformity, and freedom from imperfections are especially important! Oil field experience proves that these liners have those very qualities in *extra* measure! Here's why:

These parts, like thousands of others of many types, were first cast *centrifugally* by the Shenango-Penn process, then finish-machined in the modern Shenango-Penn shops. This process cinches *many* advantages . . . such as finer, pressure-dense grain, an 8 to 20% increase in tensile, exceptional resistance to wear and distortion, up to 30% greater elongation, *positive* relief

from sand inclusions and blow holes, and big savings in metal and machining time.

What symmetrical parts, big or little, ferrous or non-ferrous, go into the machinery you build or use? How about bushings, bearings, liners, sleeves, rolls, roll covers, rings, cylinders, tubes or similar items? Shenango-Penn engineers welcome the chance to show you how you can combine better performance with savings in time and money . . . right from the blueprint stage on through!

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2473 WEST THIRD STREET • DOVER, OHIO
Executive Offices: Pittsburgh, Pa.

FREE BULLETINS

No. 143—Centrifugal castings of non-ferrous metals and alloys.
No. 144—Centrifugal and static castings of plain and alloyed irons.
No. 145—Centrifugally cast bushing stock in all standard sizes.

SHENANGO
- **PENN**

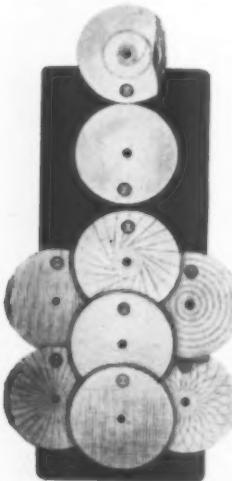


**ALL BRONZES • MONEL METAL
NI-RESIST • MEEHANITE METAL®**

shine, mister?

Wait a minute, Walter! Don't use that rasp. For best results use a shoe buff. And for best results in buffing metals, use the buff that's designed and made to do the job right.

H-VW-M produces top-quality buffs of all types for metal and plastics finishing. Exclusive manufacturing methods and high grade textiles assure better conveyance of composition, less buff raveling and longer life. Red-E-to-Use face gives perfect balance . . . requires no initial raking.



Single and double folded Triplex construction embodies added strength and stiffness, with a maximum number of thread ends bearing on the metal.

Full disc buffs are made from selected sheeting. Sewing is either one row around arbor hole or in other sewing as required.

Pieced buffs are available in premier quality, generous section construction. They will do many jobs as well as more expensive types at 40% less cost. Highest efficiency is assured by H-VW-M job-designed sewing: spiral, square, concentric, radial, petal or parallel.

For full information, write for Bulletin BC-104, or ask an H-VW-M sales engineer to call and recommend the buff that will do the job right.



HANSON-VAN WINKLE-MUNNING COMPANY
MATAWAN, NEW JERSEY

Manufacturers of a complete line of electroplating and polishing equipment and supplies

Plants: Matawan, New Jersey • Anderson, Indiana

Sales Offices: Anderson • Chicago • Cleveland • Dayton • Detroit

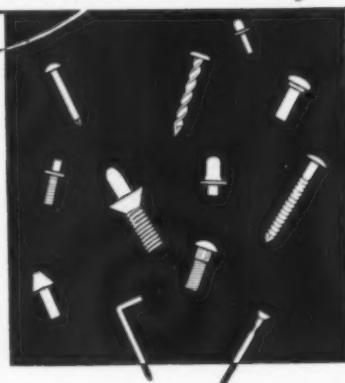
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special nails • rivets • screws • made to your order



HASSALL cold-heading may solve your immediate special part problem . . . Special nails, rivets and threaded parts made in diameters from 1/32" to 3/8"—lengths up to 7" . . . Rivets 3/32" diameter and smaller a specialty . . . Variety of metals, finishes and secondary operations . . . Economy, quality and quick delivery in large or small quantities . . . Tell us what you need . . . We will answer promptly. **ASK FOR FREE CATALOG.** 3-color Decimal Equivalents Wall Chart free on request.

JOHN HASSALL, INC. 404 Oakland Street
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Manufacturers of Cold-Headed Specialties—Established 1850



ESTABLISHED 1850

INDUSTRIAL-STANDARD SILENT CHAIN DRIVES FROM STOCK

Link-Belt Company, 307 N. Michigan Ave., Chicago 1, Ill., has announced the development of stock silent chain that will operate on sprockets cut to the new Industrial-Standard tooth form. The announcement also states that Link-Belt stock silent chain sprockets will fit the new Industrial-Standard silent chain.

The new stock-drive silent chain is now available in middle-guide type in two pitch sizes: 1/2" (SC-4), in widths of 3/4", 1", 1 1/2", 2", 2 1/2", 3", and 3 1/2"; and 3/4" (SC-6), in widths of 2", 3", 4", and 5".

In a new 48-page book, No. 2125, complete stock drives in sizes from 1/2 to 50 hp are tabulated in easy-to-use selection tables.



PALLET HANDLING TRUCK

A pallet handling type of truck, known as the Truck-Man Pallet Toter, has been added to the line of gasoline-powered material handling equipment made by Truck-Man Inc., Jackson, Mich. An important feature of the new toter is the ratio of



The Pallet Toter's capacity is 3000 lbs.

truck weight (920 lbs.) to pay load capacity which is estimated as being 3,000 pounds. The toter is designed around the company's pneumatic-tired power turret which provides turning within its own length. It is gasoline powered with a 3 hp Wisconsin engine. Wheels are of the rubber insert load type. Speeds in either direction are from creeping upward to three miles per hour. All controls, including the brake, are incorporated in the single transmission lever.

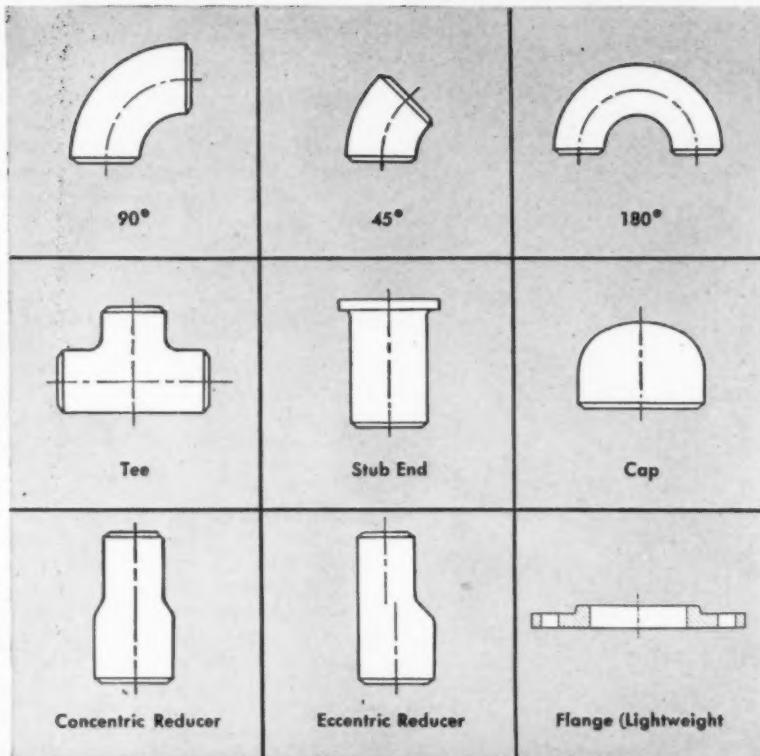


STARCH IN PAPER COATINGS AND FOR STICKERS

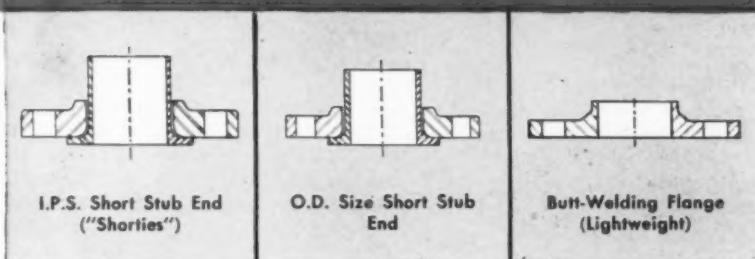
About one percent of our national corn crop is used to make corn starch but that small percentage assumes greater significance when expressed as 1 1/2 billion pounds of starch per year, states the American Cyanamid Company, New York. That amount will stiffen a great many shirt fronts and textile yarns, provide "stickum" for stamps, and envelope flaps, and sizes to smooth the surface of miles of paper.

Starch is an excellent, low-cost sizing material for paper coatings but they lack resistance to handling with moist hands. It is generally known that wet-rub resistance is improved considerably by the addition of 10% to 30% of specific thermosetting resins. The starch-resin com-

(Please turn to page 300)



A NEW SLANT ON FLANGED CONNECTIONS



I.P.S. Short Stub End ("Shorties")

O.D. Size Short Stub End

Butt-Welding Flange (Lightweight)

Seamless stub ends for 10-S and 40-S piping with 150 lb. A.S.A. carbon steel lap joint flanges.

Seamless stub ends for O.D. tubing sizes with 150 lb. A.S.A. carbon steel lap joint flanges.

Lightweight stainless flanges (125 lb. American Standard diameter and drilling) for butt-welding to Schedule 10-S pipe.

TAYLOR FORGE WeldELLS and FLANGES

UNIFORMLY EXCELLENT

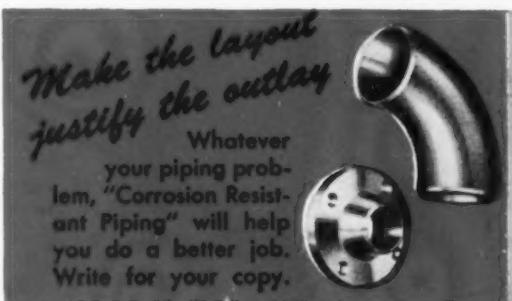
.... for conditions requiring:
Product Purity
Corrosion Resistance
Extremely High Temperatures
Extremely Low Temperatures
Maximum Economies

Available in Stainless 304, 316, 347, Monel, Inconel, Nickel, Copper; also other usual industrial metals.

Fitting sizes: $\frac{3}{4}$ " through 12" and larger. Wall thicknesses: schedules 40S, 80S, 10S and others. Flange sizes: $\frac{3}{4}$ " through 30" and larger.

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TAYLOR FORGE & PIPE WORKS General Offices & Works: Chicago 90, Ill. (P. O. Box 485) Eastern Plant: Carnegie, Pa.
District Offices—New York: 50 Church Street • Philadelphia: Broad Street Station Bldg. • Chicago District Sales: 208 S. LaSalle Street
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Mail to Taylor Forge & Pipe Works
P. O. Box 485, Chicago 90, Illinois



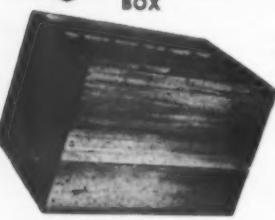
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BOX



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Shipping is a critical problem today—rushing overdue materials with insufficient facilities. Damage runs high. The answer: Protection must come from the shipping container itself. That's why American stresses **engineered protection** for all your boxes and crates. Increases safety factor in your shipments, **economically**—inexpensive container, easy packing, lightweight for low rate.

Try before you buy. Send your products to American for a sample packing. They will be returned in the American box or crate best suited for the job, and **engineered** for utmost protection. Our quotation will be included, and **no obligation**.

THE *American* BOX COMPANY

Est. 1901 • 1901 W. 3rd Street • Phone: MAin 4221 • Cleveland 13, Ohio

Branch Plant: Marion, S. C.

(Continued from page 298)

binations require proper adjustment before application to the paper but these problems have been solved by cooperation between the paper coaters and the laboratory staff.

Pigments are commonly used in paper coatings; clay, for instance, produces a smooth surface and titanium dioxide imparts extra whiteness. These pigments disperse more readily in the coating if small amounts of certain chemicals are added. Soda ash and trisodium phosphate have been used for the purpose, but it was found that some of the polyphosphates are vastly superior.

Another investigation provided that the addition of a certain wax size introduced more good properties. It prevented pigment dusting on the paper surface, therefore printing ink receptivity was more uniform and the printing was noticeably better. In addition, the wax size reduced that objectionable curling which sometimes occurs on ordinary coated paper.

Fascinating physical-chemical phenomena are involved in the new starch-pigment-resin wax coatings. Many forces at various interfaces come into play and although each component performs according to well defined laws, the composite is quite complex. We know that this composite coating produces better coated paper but we are not so certain of the whys and wherefores.

CURTAIN AND DRAPERY FABRICS WOVEN OF FIBERGLAS YARNS

A new line of "Coronized" Fiberglas curtain and drapery fabrics with greatly improved handling, draping and cleaning qualities, and with the noncombustible, nonshrinking and rot-proof qualities that characterize all fabrics woven of Fiberglas yarn, is announced by Owens-Corning Fiberglas Corp., 16 E. 56th St., New York.

The first fabric in the new Coronized line is a heavy-weight marquisette curtain material, in a range of pastel shades, designed primarily for use as fire-safe curtains in hotels, theatres, night clubs, schools, and in other contract installations handled by decorators, industrial designers and architects. Additional fabrics in the new line, for similar installations, are expected to be ready by late summer.

Coronizing is the name given to a process the company has developed to provide fabrics woven of Fiberglas yarns with a permanent soft feel and good draping-characteristics. The process involves subjecting the fabrics to a series of treatments under intense heat, by which a permanent, relaxing crimp is given to the yarns. The fabrics are then further treated, after which they are ready to be dyed and finished.

In addition to their other properties, the Coronized fabrics are wrinkle-resistant and water-repellent. The fabrics can be hand or machine sewn like any other fabric. They can be hand or machine washed, or dry cleaned by conventional methods. No ironing, stretching or framing is necessary. The fabrics dry rapidly because the yarn does not absorb moisture.

fabrication is simpler, more economical with

WEIRTON

HIGH-CARBON STRIP
COLD-ROLLED SPRING STEEL



Constant uniformity is essential to high speed production and Weirton recognizes this in providing Weirton cold-rolled spring steel. Where forming in fabrication is desired, it is supplied spheroidized-annealed, soft and ductile. Where clean, economical blanking is desired, it is temper rolled to produce controlled ranges of hardness and tensile strength. Cold-forming or blanking are much easier, and high fatigue resistance is assured in the product.

After forming or blanking, it responds accurately to heat treatment. It has rigidly controlled chemical and physical properties, exact constancy of grain structure, and controlled decarburization limits. Supplied in the desired chemical analysis and for specific heat-treating and hardness ranges in strips up to 7 inches wide.

WEIRTON STEEL CO.

WEIRTON, W. VA., Sales Offices in Principal Cities

Division of NATIONAL STEEL CORPORATION, Executive Offices, Pittsburgh, Pennsylvania



PERSONALITIES

in the NEWS

C. W. Wallace has been named assistant manager of the materials and purchasing department of Mid-Continent Petroleum Corp., Tulsa, Okla. W. G. Warnock is the manager of the department.

Mr. Wallace succeeds S. L. Gilliam, who has retired. Mr. Gilliam had had the title Purchasing Agent, which has now been discontinued in line with company policy.

George W. Aljian, Director of Purchasing and Packaging, Hawaiian Sugar Refining Corp., Crockett, Calif., was chairman of a session at the first Western Conference on Packaging, Packing and Shipping, held in San Francisco, Calif., August 10 to 13. Harold R. Morrison, Purchasing Agent, Union Oil Company, San Francisco, was a speaker at the same session on "The Outlook in Packaging Costs".

M. M. Nebauer, vice-president of Gray Drug Stores, Inc., Cleveland, O., has been named Director of Purchases for the company.

Francis White, Director of Purchases for The Budd Company, Philadelphia, Pa., has been placed in complete charge of all purchasing within the company, including the Hunting Park and Red Lion plants, Philadelphia, and the Charlevoix and Atwater plants in Detroit, Mich.

Carl Koelsch, who has been in charge of steel purchases for the Detroit plants since last September, has been transferred to Philadelphia, and will be second in authority to Mr. White in steel procurement.

Frank S. Austin has been appointed Vice President, Purchases and Stores, and Allan L. Prentice as Manager, Purchases and Stores, of the New York Central System, with headquarters in New York, N. Y.

Mr. Austin, who had been Manager, Purchases and Stores, since 1946, entered the service of the Central in 1909 in the Maintenance of Way department at Boston, Mass. In subsequent promotions he served as supervisor of track at Worcester and Boston, General Storekeeper at Springfield, Mass., Purchasing Agent at Boston, and then at New York City as Assistant Purchasing Agent, Purchasing Agent and General Purchasing Agent before he was appointed Manager, Purchases and Stores.

Mr. Prentice, promoted from General

Purchasing Agent, entered the service of the Central in 1914 in the Maintenance of Way department at Erie, Pa. Among subsequent promotions he was Supervisor, Scrap & Reclamation, and then Manager, Stores & Reclamation, at Ashtabula, O., before his appointment as General Purchasing Agent in September, 1946.

John W. Livermore has been appointed Purchasing Agent for the Transformer and Allied Product Divisions, General Electric Company, Pittsfield, Mass. He succeeds William H. Sanborn, who retired after 39 years' service with the company.

Mr. Livermore has been with GE since 1928, when he worked in the payroll and cost sections while attending the business



John W. Livermore

training course in Schenectady. In 1934 he transferred to the General Purchasing Department as a general clerk and was named assistant buyer in 1938. Appointed buyer of the department in 1940, he remained in that capacity until his transfer to Pittsfield in 1947, where he was named Assistant Works Purchasing Agent. Mr. Livermore attended Dartmouth College and Cornell University.

Victor F. Clark, Robert Dick, and Clifford S. Billingham have been appointed buyers in the Stamford Division of the Yale & Towne Mfg. Co., Stamford, Conn., under A. B. Nordin, Jr., Purchasing Agent. The three men prepared for their posts by serving as expeditors in the department.

Mr. Clark is a graduate of Harvard University, and attended the Harvard School of Business, and joined the company in February of this year. Mr. Dick, who was in the class of 1942 at Brown University, joined the company in 1946. Mr. Billingham has been with Yale & Towne since 1942.

Richard Wolcott has joined the George E. Swett & Co. Engineers, Inc., San Francisco, Calif., as Manager of Purchases and Stores. He has been connected in various capacities with the Bethlehem Steel Company and the United Engineering Company of San Francisco.

C. E. Richardson has been appointed head of the purchasing department of the newly established mid-continent gas-gasoline division of the Fluor Corporation, Ltd., Houston, Tex.

H. S. Mitchell has been named Assistant Purchasing Agent of the Ohmer Corporation, subsidiary of Rockwell Manufacturing Company, Dayton, O. He succeeds P. K. McCaren, who resigned.

James E. Coleman has been named Assistant Purchasing Agent for the Pittsburgh Group of associated natural gas companies in The Columbia Gas System, Inc.

Mr. Coleman joined the public utility organization in 1937 as an industrial engineer. Since 1945 he has been assistant sales manager. A graduate of Cornell University, he will assist John M. Simpson, Purchasing Agent, in the Pittsburgh, Pa., general office of the associated gas companies.

Harold T. Porter, former assistant comptroller at DePauw University, has accepted the position of Purchasing Agent at Tulane University, New Orleans, La.

Harry H. Martin has been named Director of Purchases for Colonial Radio Corporation, Buffalo, N. Y. He succeeds James H. Dray who has joined the management of Kaylan Cutlery Co., Syracuse, N. Y.

B. H. Tomlinson has been named Assistant Secretary and General Purchasing Agent for The Hoerner Corporation, whose executive offices are in Keokuk, Iowa, and who manage the following corrugated box companies: ABC Corrugated Box Company, Minneapolis, Minnesota; Arkansas Box Company, Fort Smith, Arkansas; Des Moines Container Company, Des Moines, Iowa; Iowa Fiber Box Company, Keokuk, Iowa; Ottumwa Shipping Containers, Ottumwa, Iowa; South West Box Company, Sand Springs, Oklahoma; Southwest Corrugated Box Company, Fort Worth, Texas; Cajas y Empaques Impermeables, S.A., Mexico, D.F.

(Please turn to page 304)



RUNS THREE TIMES AS LONG BETWEEN SHUTDOWNS

Suniso Refrigeration Oil Eliminates Two-Thirds of Shutdowns in Ice-Cream Plant

An ice-cream manufacturer was forced to shut down his refrigeration plant with abnormal frequency because heavy sludge formed in the compressor. Taking the advice of a Sun Engineer to switch to Suniso Refrigeration Oil of the correct grade, he found he could run the plant three times as long without an oil change. He reduced maintenance time by one-

third. Savings were substantial, and output increased correspondingly.

This is typical of the stepped-up production and the savings often made possible where Sun petroleum products are used. For example, by switching to a Sun cutting oil, a manufacturer increased production of optical instrument parts by 43 percent. A manufacturer of radio components tripled the life of

threading dies by changing to one of the new Sunicut oils made with Petrofac.* A cotton fabrics manufacturer is saving \$1,000 a year on the cost of processing-oil alone by using a Sun product that solved his corrosion problem.

For information about Sun "Job Proved" products for your industry, call the nearest Sun Office.

*Petrofac is a trademark of Sun Oil Company.

SUN OIL COMPANY • Philadelphia 3, Pa.

In Canada: Sun Oil Company, Ltd.

Toronto and Montreal

SUN PETROLEUM PRODUCTS

"JOB PROVED" IN EVERY INDUSTRY



Roy W. Wiley has been appointed Director of Purchases for the Thor Corporation, Cicero, Ill. He succeeds Raymond J. Healy who recently became secretary-treasurer of the company.

Mr. Wiley joined Thor in 1932. In 1935 he was appointed special sales promotion representative, and in 1941 was named to direct the company's production of three-inch armor piercing shells. At the end of the war he was named Assistant Purchasing Agent.

Robert B. Jenkins, associate professor of marketing at New York University, New York, N. Y., and wartime supervisor of purchases for the university has been named Professor of Marketing. Professor Jenkins came to N.Y.U. in 1923 as assistant supervisor of purchases and was appointed an instructor in marketing in 1929.

Edward G. Hereth has resigned as Purchasing Agent of the City of Indianapolis, a post he held for the past five years. No appointment to fill the vacancy has been made to this time.



E. A. Hughes (right, above) buyer of printing and advertising materials in the purchasing division of The B. F. Goodrich Company, is shown receiving his 20-year service emblem from **John L. Collier**, company president. The ceremonies were held recently at the company's principal headquarters in Akron, O.

Raymond M. Henry has been named to succeed Arthur W. Clinger as Purchasing Agent for The Pennzoil Company, Oil City, Pa. Mr. Clinger has been appointed wholesale sales manager.

Charles N. Balek has succeeded Robert G. Butler as Purchasing Agent of Pratt Institute, Brooklyn, N. Y. Mr. Balek was formerly a purchasing agent with Hopeman Brothers, Inc., joiner contractors.

Mr. Butler was recently honored at a luncheon meeting of the metropolitan New York group of the National Association of Educational Buyers on his retirement. He was presented with a gift by the group.

J. H. Lammert, General Purchasing Agent of the Oliver Iron and Steel Corporation, Pittsburgh, Pa., has been elected a vice-president of the corporation.

Joseph C. Marchand has been named Purchasing Agent of the Western Pacific Railroad, San Francisco, Calif. He succeeds Stanley R. Proffitt who retired from the post after 39 years continuous service with

the road. Henry J. Madison will take over Mr. Marchand's former position as general storekeeper.

PAUL L. BURROUGHS

Paul L. Burroughs, purchasing agent for the Pennsylvania Hospital, Philadelphia, Pa., passed away at his home in Philadelphia on July 18. He formerly was purchasing agent for the General Hospital, Rochester, N. Y., and was a past president of the Purchasing Agents Association of Rochester.

AMONG THE COMPANIES YOU BUY FROM

Detroit, Mich.—American Brakebuk Division, American Brake Shoe Company. Uri B. Grannis, Jr., has been appointed manager of equipment sales.

Kansas City, Mo.—United States Steel Supply Company. William A. Hunt has been named manager of the company's office here.

New York, N. Y.—American Wheelabrator & Equipment Corp. W. W. Criswell, Jr., has been appointed representative in the metropolitan New York area and in the adjacent industrial centers of Connecticut. His headquarters are at 103 Park Ave.

Bloomfield, N. J.—Westinghouse Electric Corp. Russell E. Ebersole has been appointed general manager of lamp sales, and Harold G. Cheney his assistant.

Greensboro, N. C.—Jeffreys Engineering & Equipment Co. The company's offices have been moved to the Guilford Building here, from Raleigh, N. C.

Cleveland, O.—General Electric Company. Roger W. Jackson has been named district sales manager of the Chemical Department's east central district.

Washington, D. C.—Allegheny Ludlum Steel Corp. N. H. Arbuthnot has assumed the duties of manager of sales in the District of Columbia area, in addition to serving as the company's representative in its relationships with various governmental agencies.

Detroit, Mich.—Allegheny Ludlum Steel Corp. Truman B. Brown has been appointed assistant district manager of sales in this territory.

Lebanon, Pa.—Lebanon Steel Foundry. Walter H. Flynn has joined the sales organization of the company.

Buffalo, N. Y.—Power-Pak Products, Inc. William W. Evans has been appointed general sales manager.

Chicago, Ill.—American Buff Company. Van M. Gray has been appointed St. Louis, Southern Illinois, and Minneapolis sales representative.

Detroit, Mich.—The General Detroit Corp. E. A. Warren, formerly vice-president in charge of sales is now executive vice-president. A. B. Seigfried, formerly sales manager of the fire truck division, has assumed the position of vice-president in charge of manufacturing. Preston W. Wolf has succeeded to the post of assistant general sales manager.

New York, N. Y.—Reynolds Metals Company. F. L. Sargeant has been appointed manager of the New York sales division.

Brooklyn, N. Y.—Detecto Scales, Inc. James A. Sloan has been named zone manager of the southern territory for the industrial division of the company. He will be liaison officer between the main office and district offices in Mississippi, Virginia, North and South Carolina, eastern Tennessee, Georgia, Alabama and Florida.

Detroit, Mich.—Thermod Company. A. Ray MacPherson has joined the company as manager of its industrial friction materials sales division, with headquarters here.

Cincinnati, O.—Crocker-Wheeler Electric Mfg. Co., division of Joshua Hendy Corp. Ralph S. Drummond has been appointed manager of the branch office here.

Philadelphia, Pa.—Sanson & Rowland, Inc. Richard A. Burton has joined the company and will represent it in this area.

Chicago, Ill.—Williamson Adhesives, Inc. Harry M. Faust has been named a member of the company's technical sales department.

Chicago, Ill.—Signode Steel Strapping Company. Milton C. Carlson has been



M. C. Carlson

appointed assistant sales manager. Mr. Carlson has been with the company since 1929 in various sales posts.

New York, N. Y.—The Electric Storage Battery Company. Herbert H. Warren has been named assistant manager of the company's branch here.

Canton, O.—The Timken Roller Bearing Co. Whitley B. Moore was recently elected vice-president in charge of sales, succeeding L. M. Klinedinst, retired.

Schenectady, N. Y.—General Electric Company. John B. Land has been appointed manager of sales for the petroleum and chemical industries section of the company's materials industries division.

(Please turn to page 306)

THE FAMOUS

Red Elastic Collar

IS VISIBLE EVIDENCE OF
LOCKING SECURITY



... assures accurate bolt loading
... more efficient assemblies . . . because

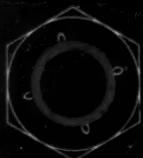
Any assembly held with ESNA Elastic Stop Nuts is secured with the force required by design calculations. This quality of uniform, closely controllable torque is a feature of the famous red elastic collar. No longer is there any need to *over* design as protection against fastener failure. Why? Because uniform bolt loading permits more compact design, with resulting weight reduction.

Further, ESNA Elastic Stop Nuts lock in position anywhere on a bolt or stud without any frictional aid from bolt tension or seat pressure. They keep bolt

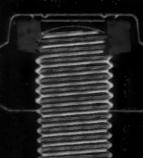
and nut threads rust-free . . . seal against liquid seepage along the bolt threads . . . and do not damage the threads. And, of course, Elastic Stop Nuts are re-usable.

HERE'S A CHALLENGE: Send us complete details of your toughest bolted trouble spot. We'll supply test nuts—FREE, in experimental quantities. Or, if you want further information, write for literature. Elastic Stop Nut Corporation of America, Union, New Jersey. Representatives and Agents are located in many principal cities.

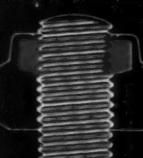
The RED ELASTIC COLLAR is . . .



PERMANENTLY CLINCHED to prevent turning under application and subsequent operational stresses.



PERMANENTLY SECURE against vibration effects. The bolt impresses (does not cut) full contact threads.



PERMANENTLY TIGHT against moisture. Bolt threads have 100% contact in collar—and a full metal seat.



REUSABLE. The Red Elastic Collar retains its grip after repeated usage.

ESNA ELASTIC STOP NUTS

TRADE MARK



INTERNAL
WRENCHING



ANCHOR



WING



SPLINE



CLINCH



GANG
CHANNEL



CAP

PRODUCTS OF: ELASTIC STOP NUT CORPORATION OF AMERICA

MORE STRENGTH.

MORE QUALITY...

MORE SERVICE...



DROP FORGED for dependability

METALLURGICALLY CONTROLLED for quality

ADEQUATELY STOCKED for prompt service

- Complete Line of Screwed and Socket Welding Fittings
- Full Range of Sizes from $\frac{1}{8}$ inch through 4 inches
- Pressure Ratings from 2000 through 6000 pounds
- Carbon, Stainless and Alloy Steels

Write for Catalog, Volume 2, Today



LADISH CO.

CUDAHY, WISCONSIN (MILWAUKEE SUBURB)

District Offices: NEW YORK • BUFFALO • PITTSBURGH • CHICAGO • PHILADELPHIA
CLEVELAND • ST. LOUIS • HOUSTON • NEW ORLEANS • LOS ANGELES

STOCKED AND SOLD BY LADISH DISTRIBUTORS IN PRINCIPAL CENTERS

Grand Rapids, Mich.—The Rapids-Standard Company, Inc. George R. Brockway has been appointed sales manager of the company. Lloyd C. Backart, formerly president and sales manager, will continue actively in the company as the chairman of the board.

New York, N. Y.—Kennametal, Inc. Gerald Bogner has been appointed engineer and representative working out the company's office at 6 West Broadway.

Flint, Mich.—Norton Company. Norman V. Crabtree, abrasive engineer, has been appointed for this territory. He will replace Harlan T. Pierpont, who has been transferred to Worcester, Mass. to become sales manager of the company's refractories division.

Detroit, Mich.—Tinnerman Products, Inc. Ray B. Templeman has been named Detroit district manager for the company.



Ray B. Templeman

He joined Tinnerman last year after serving the Chevrolet division of General Motors Corp. for 12 years.

St. Louis, Mo.—Bemis Bro. Bag Co. C. W. Akin, until recently sales manager of the company's plant at St. Helens, Ore., has been transferred to the general sales office where he will coordinate multiwall paper bag sales throughout the company.

Reading, Pa.—Luria Brothers & Company, Inc. Russel J. Aurentz has been appointed district manager, and John F. McGahey assistant district manager here.

Houston, Tex.—Macwhyte Company. W. Howard Minton is the new direct factory representative, covering the Gulf Coast area.

San Francisco, Calif.—The Ira G. Perin Co. James W. Lafferty has been named technical sales engineer. The company is California distributor for Elwell-Parker materials handling equipment.

Kansas City, Mo.—Berger Manufacturing Division, Republic Steel Corp. Ralph C. Braden, Jr. will handle steel equipment products sales in Nebraska, Kansas, western portions of Iowa and Missouri, and the northeastern part of Oklahoma.

Boston, Mass.—Federated Metals, division of American Smelting and Refining Company. The company's New England office has been moved to new quarters in the Statler Office Building, 20 Providence St.

(Please turn to page 308)

UNITED STATES RUBBER COMPANY

SERVING THROUGH SCIENCE

With a Lift of Her Finger... She Raises Pressure by the Ton!

U. S. Royalite
Grinding Wheel Sample
being tested with this
specially-designed ma-
chine in a U. S. Rubber
Company laboratory.



Here, on a specially-designed machine, "U. S." engineers have taken a grinding wheel sample and just tested it to destruction!

But before this grinding wheel reached the breaking point, it had proved its ability not only to meet, but to *surpass*, the strict specifications demanded by the customer's job.

Thorough testing in "U. S." research laboratories is one of the reasons why U. S. Royalite Grinding Wheels are so much in demand, testing that covers not only abrasives and bonds of every kind, but also the related fields covered by all the products of United States Rubber Company.

Then there's the test of time. Experience built up in the course of 84 years enables "U. S." to solve current wheel problems of every type—and to anticipate future problems brought on by higher production quotas and new manufacturing techniques.

As a result, whether you're snagging castings, grinding ball races or working with billets, bits, slabs or sauce pans, you'll find a U. S. Royalite Wheel carefully *engineered to your job*. In addition, "U. S." field engineers, by thorough testing right in your own plant, can give you accurate grinding wheel costs *in advance*.

For complete information, write to Mechanical Goods Division, United States Rubber Company, 1230 Avenue of the Americas, New York 20, N. Y.



When this midwestern iron foundry adopted high speed snagging 17 years ago, it picked U. S. Royalite Wheels. It has been using them ever since on the basis of their superior performance.

U. S. ROYALITE GRINDING WHEELS ENGINEERED TO YOUR JOB



RAWHIDE gives you *more* in soft hammers and mallets. And *Chicago Rawhide* gives you exceptional power and maximum protection. C/R hammers and mallets absorb shock, deliver powerful blows, protect finished surfaces and stand up under tough use. For hammers and mallets that never split, crumble or mushroom, always ask for *Chicago Rawhide*.

C/R Hammers have malleable iron heads with replaceable coiled rawhide faces.

CHICAGO Rawhide MFG. CO.

1203 ELSTON AVENUE CHICAGO 22, ILLINOIS

Other C/R maintenance products are: round, flat, twist belting; belt pins and lacings; gears, pinions, gear blanks; aprons, hand leathers; hydraulic packings.

Louisville, Ky.—Reynolds Metals Co. M. A. Sievert has been named an engineer in the Technical Service Department.

Shreveport, La.—Dearborn Chemical Company. F. E. Rolston has been assigned to the Louisiana, Arkansas and part of eastern Texas territory, previously covered by Tom Holcombe.

Cleveland, O.—Allis-Chalmers. P. F. Bauer has been named manager of the newly formed central region of the company's general machinery division.

Pittsburgh Pa.—Oliver Iron and Steel Corporation. John Krause, Jr., has been appointed assistant manager of sales, industrial fasteners division.

Beaver Falls, Pa.—The Babcock & Wilcox Tube Co. William J. Thomas has been named general sales manager.

Arlington, N. J.—E. I. duPont de Nemours and Company, Inc. Leslie B. Gillie has succeeded William A. Joslyn as director of industrial sales in the plastics department. Mr. Joslyn has retired.

New York, N. Y.—American Floor Surfacing Machine Co. A sales office has been opened here at 670 Sixth Avenue, with T. J. Mueller as manager of the greater New York area.

Wilkes-Barre, Pa.—Link Belt Company. Crozier S. Wileman has been appointed district sales manager to succeed A. C. Williams, retired.

INDUSTRIAL DEVELOPMENTS

Meredith, Simmons & Co., Ltd., the Canadian affiliate of National Adhesives, has opened a new glue and adhesives plant in Toronto.

Reed Rolled Thread Die Co., Worcester, Mass., has purchased the ownership of The Cleveland Die & Mfg. Co., Cleveland, O. Henry Bockelman will continue as manager of the Cleveland plant until it is moved to Worcester.

The American Bantam Car Company, Butler, Pa. has purchased The Newgren Company, Toledo, O., subsidiary of the Monroe Auto Equipment Company.

United States Steel Supply Company, warehousing subsidiary of United States Steel Corp. has opened a large steel warehouse and facilities in San Francisco, Calif.

Kearney & Trecker Corp., Milwaukee, Wis. has purchased the Walker-Turner Co., Inc., Plainfield, N. J., manufacturers of light machine tools.

Tube Turns, Inc., Louisville, Ky., has acquired the Pennsylvania Forge Corp.

The Glidden Co., Cleveland, O. has purchased 50 acres of land at Macon, Ga. and plans to build three factories there at an investment of several million dollars.

(Please turn to page 310)

Stainless Steel Pipe Lines

Right Off the Shelf!

Whether you use it to handle chemicals . . . foodstuffs . . . or dairy products . . . you'll find everything you need for that stainless pipe line right in Frasse warehouse stock.

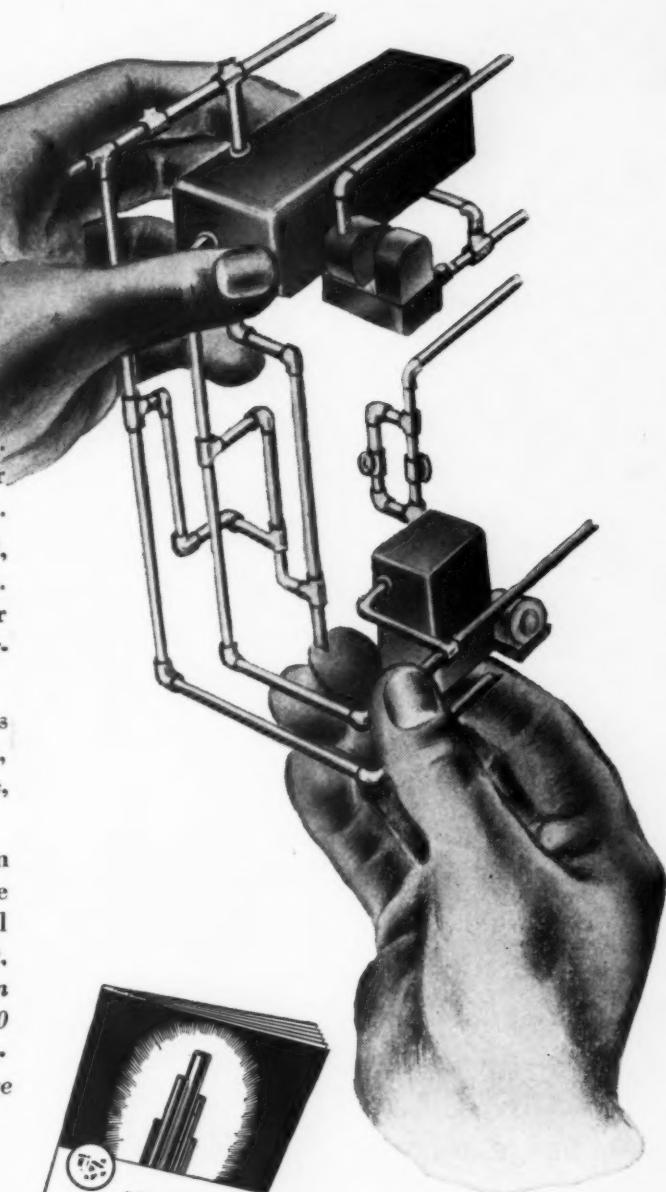
Stainless pipe? Frasse stocks it in seamless or welded, standard or extra heavy—and in a complete range of sizes. You can choose the analysis, too—type 304, type 316 for severe corrosive conditions, or type 347 for high temperature use. All are on hand for immediate delivery.

Valves and fittings are equally handy. Frasse stocks stainless gate and globe valves, nipples, elbows, couplings, tees, unions—everything you need to hook up a new line, or replace a section.

It's convenient to work with the range and variety in Frasse stocks—and the quick delivery helps you get the job done. Whenever the layout calls for stainless—call Frasse. *Peter A. Frasse and Co., Inc., 17 Grand Street, New York 13, N. Y. (Walker 5-2200) • 3911 Wissahickon Avenue, Philadelphia 29, Pa. (Baldwin 9-9900) • 50 Exchange Street, Buffalo 3, N. Y. (Washington 2000) • Jersey City • Syracuse • Hartford • Rochester • Baltimore*

NEW! For Stainless Pipe and Tube Users!

This new 24-page manual is brimful of useful data on stainless steel tubular products. Includes type characteristics, physical properties, fabricating data, tolerances, standard finishes, corrosion resistance, and similar essential information. Invaluable for reference if you're working with stainless tube or pipe. Send for your free copy today.



64A

Peter A. Frasse and Co., Inc.
17 Grand Street, New York 13, N. Y.

Please send me a complimentary copy of your new stainless tube and pipe manual.

Name..... Title.....

Firm.....

Address.....

FRASSE ... for
Stainless Tubing, Pipe,
Valves and Fittings

A NEW HIGH ... IN BRONZE GATE VALVE DESIGN

LUNKENHEIMER 200 LB. BRONZE UNION BONNET GATE VALVE

The new Lunkenheimer 200 Lb. Bronze Union Bonnet Gate Valve incorporates the first application of full cylindrical body sections in bronze gate valves. This construction, previously used only in higher pressure steel valves, provides great strength and maximum resistance against distortion of the valve body and seats due to internal pressure strains and other stresses. Tests made under the most severe conditions prove that this design will not distort and will maintain initial proportions and seat tightness.

In addition to the cylindrical body construction and other service-giving features, these valves employ Lunkenheimer's patented Alloy Stems which eliminate stem thread failure due to wear.

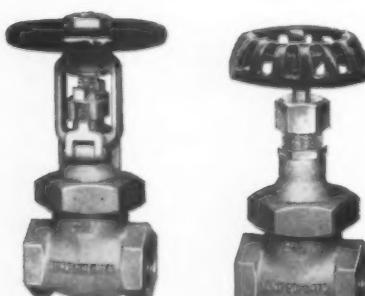
ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI 14, OHIO, U. S. A.
NEW YORK 13, CHICAGO 6
BOSTON 10, PHILADELPHIA 38
EXPORT DEPT. 318-322 HUDSON ST., NEW YORK 13, N. Y.



Fig. 2228—Screw Ends

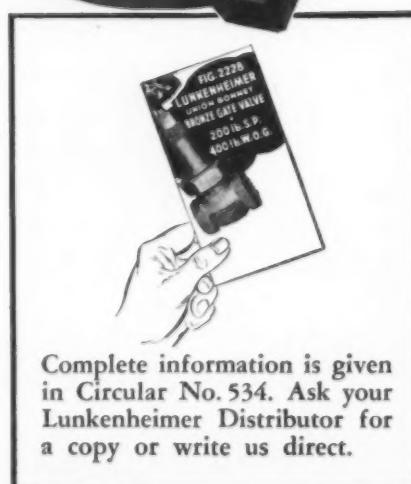
Fig. 2229—Flange Ends

Double Disc, Rising Stem



O. S. & Y.
Union Bonnet
1/4 in 2 inches
Fig. 2222 —
Screw Ends
Fig. 2233 —
Flange Ends
Wedge Disc,
Rising Stem

Union Bonnet
1/4 to 2 inches
Fig. 2230 —
Screw Ends
Fig. 2231 —
Flange Ends
Wedge Disc,
Non-rising Stem



Shell Chemical Corporation is constructing a complete plant for making oil-der'ed synthetic detergents in Wood River, Ill.

Goodyear Tire & Rubber Company, Akron, O., has established a chemical division to handle the company's manufacture and sales of synthetic rubber and its combination with other raw materials.

The Emerson Electric Company, St. Louis, Mo. has taken over a four-million dollar war plant in St. Louis for the manufacture of aircraft turrets and electronic equipment.

Turco Products, Inc., Los Angeles 1, Calif., will erect a new plant at McCook, Ill. for the manufacture of industrial cleaning compounds.

Firestone Plastics Company, Akron, O., has integrated all plastics activity, including sales, at the Firestone plant at Pottstown, Pa. Development and production have been located there together with one of Firestone's largest tire production units.

Hunter Pressed Steel Company, Lansdale, Pa., precision spring manufacturer, has changed its name to Hunter Spring Company.

Bemis Bro. Bag Co. have purchased one of the buildings now occupied by the American Refrigerator and Machine Company, Minneapolis, Minn., to house portions of the Bemis Packaging Service organization.

Paragon Testing Laboratories, Orange, N.J. producers of organic chemicals, has been purchased by The Matheson Company, Inc., East Rutherford, N. J.

Bemis Bro. Bag Co. has purchased the land, buildings and equipment formerly owned by the Gallie-King Bag Co., Houston, Tex.

Auto-Lite Battery Corporation has begun work on a new million dollar battery manufacturing plant at Clearwater, Calif.

The Glidden Company, Cleveland, O., will build a \$3,000,000 soy bean extraction plant in Indianapolis, Ind.

National Tube Company has begun production at its modernized and rebuilt No. 2 seamless pipe mill at Gary, Ind.

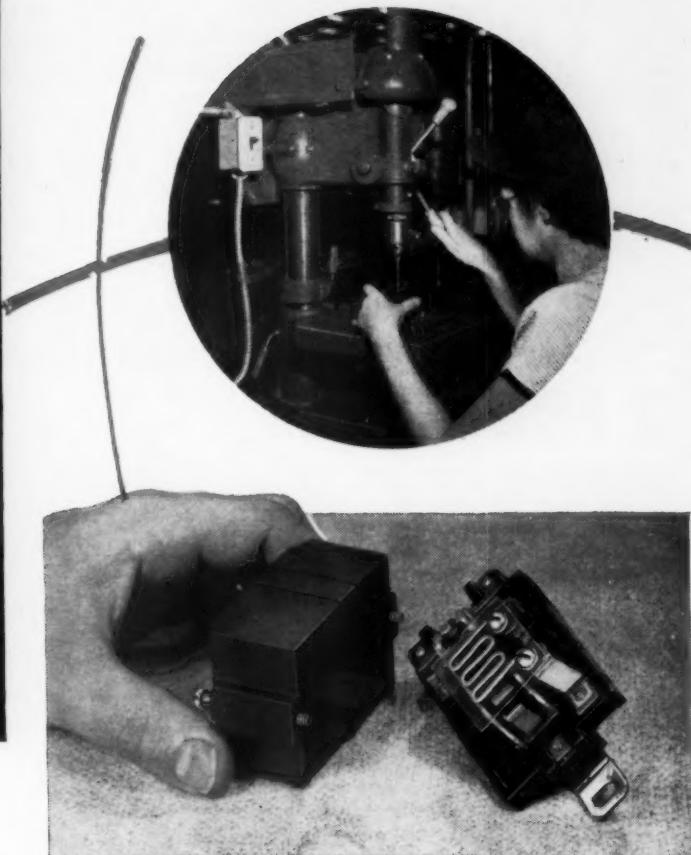
Howard Foundry Company, Chicago, Ill., has purchased a magnesium foundry in Belmont, Calif. from Dalmo-Victor, San Francisco.

Cutter-Hammer, Inc., Milwaukee, Wis., have acquired the business of the West Electric Products Co., Los Angeles, Calif.

Koppers Company, Inc., Pittsburgh, Pa. has announced the consolidation of the shops division and the piston ring division, to form the new metal products division at Baltimore, Md.

The Solvay Process Division, Allied Chemical & Dye Corporation, New York, N.Y., has begun construction on a new \$1,000,000 research laboratory in Syracuse, N. Y.

(Please turn to page 312)



F-HP* MOTOR-STARTING SWITCH...

New Design for improved performance

Entire new line of CR1061 manually operated switches—general purpose, water-tight, explosion-proof types—now available. New from cover to heater. Check these features for:

EASIER INSTALLATION

- All wiring terminals easily accessible on top of switch unit
- Heaters have one mounting screw fastened in position to prevent incorrect mounting—stamped with current rating

POSITIVE OVERLOAD PROTECTION

- Employs sturdy bi-metallic protective device
- Positive indication power is off as switch handle moves to OFF position on overload

LONGER LIFE

- Self servicing—wheel-type movable contact cleans as it rolls against stationary contacts

*Fractional Horsepower

- High interrupting capacity—arc snuffed quickly as silver contact recedes into recess in base

USE . . .

On a-c up to 1 hp at 110 to 220 volts

On d-c— $\frac{3}{4}$ hp 115 volt, $\frac{1}{3}$ hp, 230 volt

double-pole forms for 1 hp, 115 to 230 volts d-c

Fill in the coupon and send it in for more information. *Control Division, Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

Apparatus Dept., Sec. B676-276
General Electric Company
Schenectady 5, N. Y.

Gentlemen:

I want to know more about your new CR1061 switches.
Please send me Bulletin GEA-2234E.

NAME.....

COMPANY.....

ADDRESS.....

GENERAL  ELECTRIC

GRAY IRON CASTINGS

S. A. E. OR A. S. T. M.
CLASSES 20-30-40

2 FOUNDRIES

on 2 main line railroads

equipped for fast, efficient production to meet your casting requirements.

Special facilities for rollover and cope-and-drag production to 150 pounds. Other castings up to 1000 pounds.

Send us your inquiries or ask for a representative to call to discuss your casting requirements.

Compressor Unit



Intake Manifold
with Heater Body

**TYPICAL
FOREST CITY
CASTINGS**
(unre touched photos)

Gas Meter Valve Plate

**THE
FOREST CITY
FOUNDRIES
COMPANY**

2500 WEST 27TH STREET
CLEVELAND 13, OHIO
Phone PROspect 5040

Mixing Equipment Co., Rochester, N. Y. has installed its entire manufacturing operation in a new plant on the outskirts of the city.

GOODYEAR INTRODUCES NEW PLASTIC MATERIAL

Tuf-Lite is the name of new tough, high-impact, low water absorption, plastic material having good tensile strength and excellent electrical properties being introduced by the Goodyear Tire & Rubber Co., Akron, Ohio. Readily machinable, Tuf-Lite can be polished by buffing, and in the opinion of the Goodyear executives, is one of the toughest high-hardness plastic rubbers developed to date. Among the items under development are golf club heads and bowling pins.



DEPENDABLE!

NEW SALES MANAGER SCHOLLMORN DIVISION OF SARGENT & CO.

Walter Scott, for some 21 years a sales representative for Sargent & Co., New Haven, Conn., has been appointed sales



Walter Scott

manager of the Schollhorn Division of that Company, manufacturers of specialized tools and pliers, punches, shears, etc., which includes the Bernard line of pliers.

Railway Express is part of the modern miracle of transportation which makes the people of your community neighbors with those of other cities and towns from coast to coast. Neighbors . . . who depend on each other, near and far, for the essentials and luxuries which contribute to our way of life.

The men and women of Railway Express are your neighbors, too, wherever you may live. They work with you and for you to provide a complete shipping service for every one of your business and personal needs. You'll find them dependable neighbors, always ready to serve you with speed, efficiency and courtesy.

It's good business to say,
"Ship it RAILWAY EXPRESS!"

RAILWAY EXPRESS

- ... Maintains 23,000 offices (there's one near your factory, office or home);
- ... Uses 10,000 passenger trains daily;
- ... Has 18,000 motor vehicles in its pick-up and delivery services;
- ... Offers extra-fast Air Express with direct service to 1,078 cities and towns.

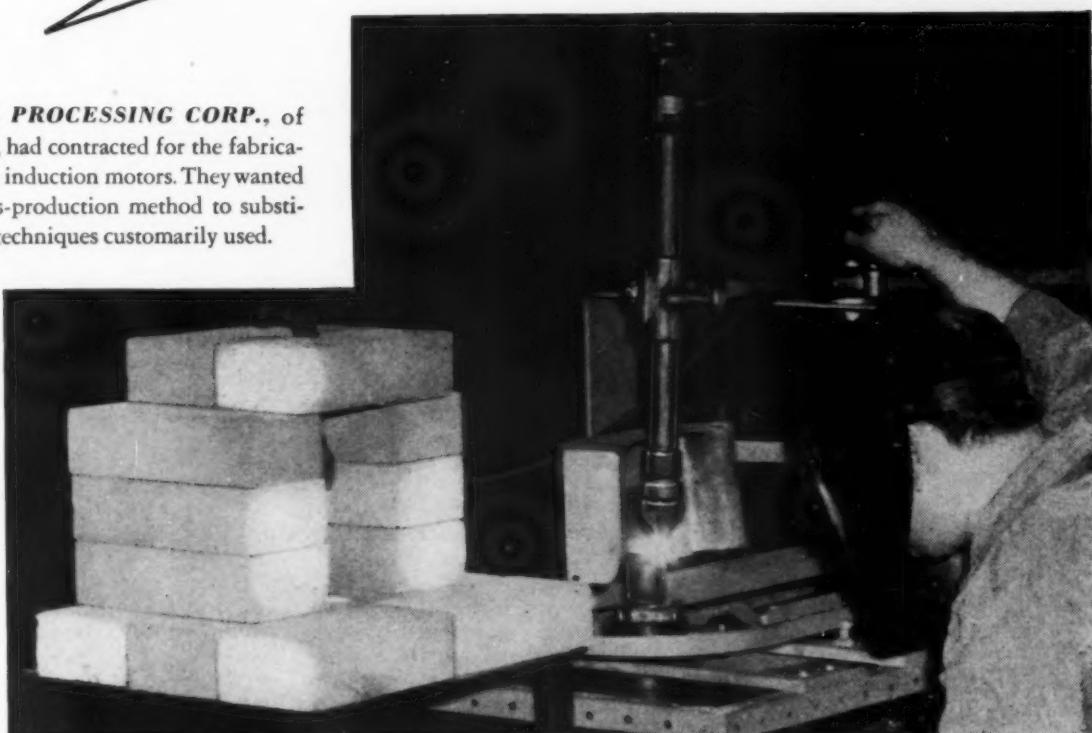


NATION-WIDE

RAIL-AIR SERVICE

Heliwelding permits mechanized rotor mass production

SALKOVER METAL PROCESSING CORP., of Long Island City, N. Y., had contracted for the fabrication of copper rotors for induction motors. They wanted a fast, mechanized mass-production method to substitute for the piece-work techniques customarily used.



H. A. Huff, Jr., Airco Technical Sales Representative, suggested Heliwelding with an Airco machine holder. He devised a balanced work-cycle which permitted a simultaneous pre-heating and welding operation. When, for example, one rotor is being preheated, another is welded. A spindle holds and turns the latter under a $\frac{1}{8}$ " tungsten electrode in an Airco water-cooled machine Heliweld holder, mounted flexibly on

the Radiograph arm. Straight polarity 150 amperes D.C. is used, with helium as the shielding gas.

The operation is rapid and production is extremely high. Not only is the method economical, but most important, it permits complete control of operating variables — results in finer welds, with a minimum of rejects.

• • • •

TECHNICAL SALES SERVICE — ANOTHER AIRCO PLUS-VALUE FOR CUSTOMERS

To assure its customers of high efficiency in all applications of the oxyacetylene flame or electric arc, Air Reduction makes available the broad, practical experience of its nationwide Technical Sales Division personnel. The collective experience and knowledge of these specialists has helped thousands to a more effective use of Airco processes and products. Ask about this Airco "Plus-Value" service today. Write your nearest Airco office. (In Texas: Magnolia Airco Gas Products Company . . . On West Coast: Air Reduction Pacific Company)



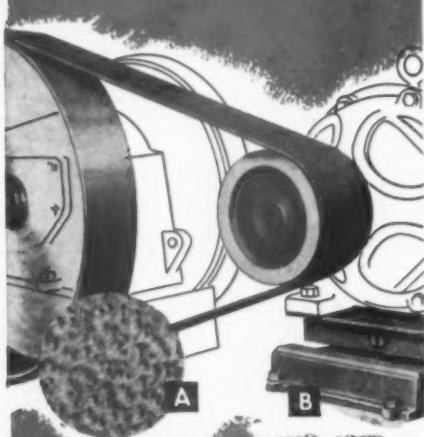
AIR REDUCTION

Offices in all principal cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Welding and Cutting Machines, Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

How this drive holds maintenance costs down

A pivoted motor base drive with Schieren Duxbak belting on the pulleys transmits power with minimum strain on bearings and belt. This means less wear... longer life.



HERE'S WHY...

A Duxbak's Pulley Grip

Schieren Duxbak belting has a clean, uniform, pore-like surface that really takes hold of a pulley. This pulley grip holds the belt to carry heavy loads at lower tension.

B Automatic Tension Control

The Rockwood pivoted motor base instantly adjusts belt tension to meet changes in load. It makes the belt lean into the heavy loads; then lets it relax to the least tension required, when the load returns to normal.

Write for further information on complete drives, leather belting, packings or leather specialties of all types.

CHAS. A. SCHIEREN COMPANY
36 FERRY STREET, NEW YORK 7, N. Y.
Tanners and Manufacturers Since 1868
Branch Offices in Chicago, Dallas, Denver,
Detroit, Newark, New York, Philadelphia,
Pittsburgh, Salt Lake City

SC-26

GUIDEBOOK FOR PURCHASING AGENTS AND OTHER EXECUTIVES

A guidebook entitled "Small Parts for Better Production", which gives full detailed technical information on all types of small parts, is available with cost from the George K. Garrett Company, 1421 Chestnut Street, Philadelphia 2, Pa. The book contains 32 pages of specification charts on lock washers, finishing washers, flat washers, C washers, retaining rings, snap rings, flat springs, coil springs, welded parts, small and medium stampings, hose clamps, expansion plugs and even ball bearing wheels used on many industrial and civilian products. Charts, for instance, show all of the SAE and ASA sizes for lock washers. Other charts show how to select the correct size of flat washer for the particular bolt and nut.

MOBILE UNIT FOR PLANT TRANSPORTATION



This is the Widgit, mobile unit made by the Beall Manufacturing Co., Cleveland, Ohio, for use by employees whose work requires speedy transportation within a plant. Controls are centralized in the tiller, and the car can be steered, started and stopped with one hand. It can be turned around in a 43-inch circle, and has a top speed of 15 miles per hour. Air-plane type brake enables the driver to stop the car within one foot even when going at maximum speed. The Widgit is powered by two six-volt automotive batteries which are good for 20 miles before recharging.

EMBOSSING ALUMINUM SHEET ANNOUNCED BY REYNOLDS

A new and different type of embossed aluminum sheet is announced by the Reynolds Metals Co., 2500 So. Third St., Louisville, Ky., with patterns in squares, diamonds, stucco, simulated grained leather, and crosswise and lengthwise ribs.

The new product can be supplied in flat sheet in thicknesses ranging from a minimum of .010 inch to a maximum of .040 inch and in widths from a minimum of 12 inches to a maximum of 48 inches. Coiled sheet can be furnished in thicknesses between .010 inch and .40 inch, and in widths ranging from 6 inches to 36 inches.

(Please turn to page 318)

Specify
and Use



Send for interesting new catalog.

CLARK BROS BOLT CO.

MILDALE, CONN.

Welding Production Goes UP When AO Duraweld Goggles Go ON!



Why? Because new, specially designed side shields keep distracting light rays from welders' eyes while providing protection from sparks and splashes. Result: more and better beads! Comfort features aid work output, too—indirect ventilation reduces fogging . . . eyecups are set for wide angle vision, have comfortable, snug-fitting edges and fit the contour of each eye.

The insulated ball chain bridge and the rubber one-piece headband adjust in a jiffy. The Duraweld is prime protection in acetylene welding, cutting, brazing and furnace work. Ask for it with 50 mm. Noviweld lenses, shades 3, 4, 5, 6 or 8, or with Noviweld-Didymium lenses, shades 3, 4, 5 and 6. Cover lenses protect both types from pitting. Your nearest AO Safety Representative can supply you.

American  Optical

COMPANY

Safety Division

SOUTH BRIDGE, MASSACHUSETTS
BRANCHES IN PRINCIPAL INDUSTRIAL CITIES



Keep The P. A. Posted on New Product Developments

"IT IS necessary to keep the P. A. informed on new developments in our industry, as well as keeping him sold on my company's materials," says Mr. B. W. Johnson, District Sales Manager of Allegheny Ludlum Steel Corporation!

"In view of the fact that we specialize in alloys, particularly stainless, we try to keep the P. A. up-to-date not only on the alloys which we produce, but new applications for which they are being used. We do this, not only by literature and advertising, but by personal visits. This we have found, has worked to our mutual interests."

Yes, Mr. Johnson is right. More than ever the P. A. is the pivot man in today's selling. That's why experienced advertisers like Allegheny Ludlum make sure the P. A. gets the latest word on product developments by advertising in *Purchasing* — read by P. A.s controlling 85% of industry's purchases.

Are you taking full advantage of the important assist well-informed P. A.s can give your organization in selling new product ideas? Why not find out what *Purchasing* can do for you? Write, *Purchasing*, 205 East 42nd St., New York 17. Offices in Chicago, Cleveland, Los Angeles.

PURCHASING

THE NATIONAL MAGAZINE FOR PURCHASING EXECUTIVES



A CONOVER-MAST PUBLICATION



Custom-Alloyed or Standard Bearing Metals

*National Bearing Division offers a complete line of bearing metals—
or any type of non-ferrous alloy to required specifications*

N-B-M Babbitt Metals have gained nationwide recognition for these important reasons: virgin metals are used exclusively . . . alloys are correctly proportioned . . . blending is controlled. Specify any of the following service-proved babbitts for long range economy and trouble-free service:

"Nickel" Babbitt	"Diesel Engine" Babbitt
"Improved" Babbitt	"Rex" Babbitt
"Regent" Babbitt	"Genuine" Babbitt
"Extra Copper-Hardened" Babbitt	

For unequalled performance in heavy duty service, specify "Tiger Bronze". "Tiger Bronze" is specially compounded to give maximum density with minimum friction . . . withstands heavy

shock and pounding. Furnished in cored or solid bars, rough or machined.

When your bearings are subjected to unusually severe or heavy duty service, call the nearest National Bearing Division service engineer. Many bearing applications require "custom-alloyed" bearing metals for lining and shells. National Bearing has the unique ability, acquired by 74 years of experience, to give you thorough engineering service on problems of design, stress loading, alloy and lubrication.

For fewer shutdowns and lower maintenance costs, let National Bearing's unique service take over your bearing problems.



AMERICAN

Brake Shoe

COMPANY

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ERIE SPECIAL BOLTING FOR HEAVY MACHINERY

FOR over 30 years ERIE has specialized in the manufacture of high quality bolting. We use the very latest equipment for heat treating, machining, grinding and threading. We are certain that we can produce better bolting at a saving to you because we are specialists — send us your bolting specification for our estimate.



A DEPENDABLE SOURCE OF HIGH QUALITY BOLTING FOR RAILROADS, REFINERIES, DIESELS, FARM MACHINERY, EXCAVATING EQUIPMENT AND ALL TYPES OF HEAVY MACHINERY.

ERIE BOLT & NUT CO.
SUBSIDIARY OF BARUM STEEL CORPORATION
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STUDS • BOLTS • NUTS ~ ~ ALLOYS • STAINLESS • CARBON • BRONZE

*Pull-tab Opener
in Every Roll
SAVES TIME - SAVES TAPE*

**SAFETEX
GUMMED TAPE**

*SEAL IT
RIGHT
WITH GUMMED TAPE*

**CENTRAL PAPER COMPANY,
Menasha, Wis.**

(Continued from page 314)

The "rib" pattern offers the advantage of selective stiffening of the sheet. Through this pattern the sheet is stiffened in the direction of the ribs, but flexible in the opposite direction. The "stucco" pattern, when used in ceiling panels, breaks up the large surface and softens any reflections. It may be formed and bent in both directions without damage.

Certain patterns of embossed aluminum, it is said, reinforce the sheet and increase its structural strength to a point where aluminum can replace steel, thickness for thickness, and retain the same original rigidity.

N.E. STEELS ONE-EIGHTH OF POSTWAR STEEL OUTPUT

Of all alloy steels produced since the war ended, it is estimated that about one-eighth of the total were "N.E." or National Emergency steels, which were originally developed under emergency conditions during the war to conserve critical alloying elements. However, these steels have proven to be highly useful for peacetime purposes and remain in demand, although the need for conservation of alloys has been greatly lessened.

The N.E. steels have been standardized by the American Iron and Steel Institute and the Society of Automotive Engineers. Today, at least one of the most popular automobiles on the market uses the former N.E. steels, now known as "triple alloy steels," almost exclusively in its transmission, gears, axles, steering equipment, springs, and in certain other parts.

Closely Controlled

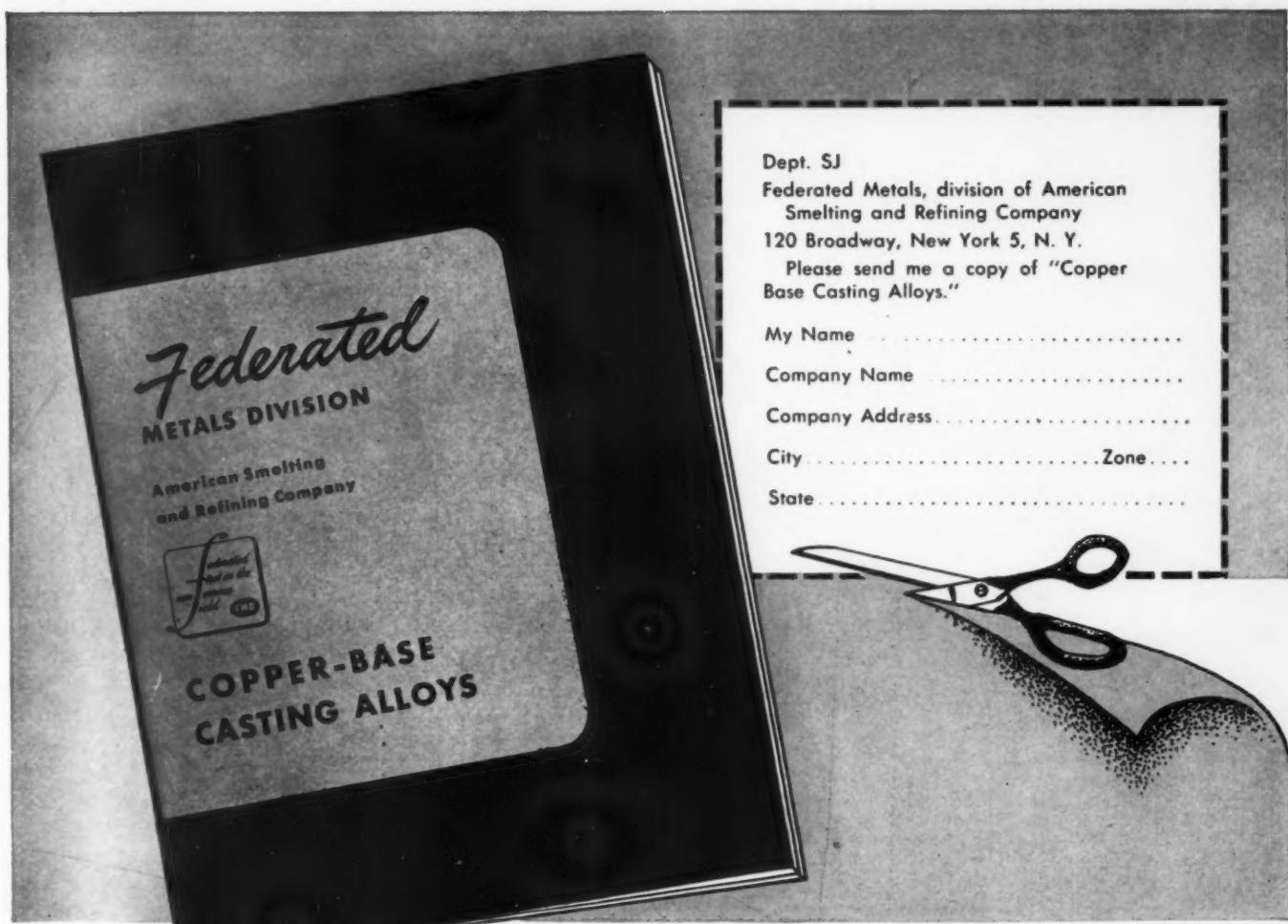
The new concept of specifying steel to hardenability limits, rather than to chemical compositions alone, means that all the alloying elements present must be known. This requires close control, and under such conditions the N.E. steels offer uniformity in machining and heat treating characteristics. This is also true of other alloy steels specified to hardenability limits.

The triple alloy steels were created in 1941, and permitted the utilization of large quantities of high alloy scrap made available as alloy steel production rose to new record levels during the war. The machining of many war products resulted in high scrap losses, and this scrap was hastened back to the steelmaking furnaces to make the triple alloy steels. By using the alloys in this scrap in the newly developed analyses, the combination of small amounts of several alloys in a heat of steel eliminated the earlier necessity for higher amounts of one or two alloys for the making of other alloy steels.

Alloys Conserved During War

By 1943, about one-third of total alloy production comprised triple alloy steels, yet in that year about 34,000 tons of nickel, 6,000 tons of chromium, and 2,000 tons of molybdenum were conserved. Conservation measures such as these helped the United States overcome serious shortages of several alloying elements such as nickel, chromium, tungsten and others.

(Please turn to page 320)



JMLeo F-HH15

SNIP... AND IT'S YOURS!



"Copper-Base Casting Alloys" is a 52-page book published for you by Federated Metals.

It discusses the metallurgy and practical behavior of high copper alloys, tin bronzes, red brasses, yellow brasses, manganese bronze, nickel silver, aluminum bronze, silicon bronze and silicon brass.

It brings you the vast knowledge of the Federated research and service staffs on such important subjects as thermal effects, shrinkage porosity and gas porosity. It includes a handy compilation of industry specifications . . . ASTM, AMS, SAE, Federal, U. S. Navy, and others.

In short, "Copper-Base Casting Alloys" is an authoritative book you should have and can have . . . for education, for reference, for lower costs and bigger profits. Clip the coupon and mail it to Federated NOW!

Call Federated first for non-ferrous metal supplies... for the answers to your non-ferrous metal problems. Twenty-six sales offices in cities across the nation.



Federated METALS

Division of American Smelting and Refining Company, 120 Broadway, New York 5, N. Y.

Close-coupled or pedestal-mounted

This Ampco Pump

meets your acid test

— a corrosion-resistant pump sold as a standard model without a price premium

You don't have to pay extra for special production to get a corrosion-resistant pump. Ampco's aluminum bronze centrifugal pump is a standard model — at standard-model prices.

With this new pump, you can cut the cost of original equipment, reduce replacement frequency, and be sure of efficient handling of your corrosive and erosive thin liquids. Its corrosion-resistance prevents contamination. All passages are designed for smooth, quiet flow. Grades of aluminum bronze are varied to give maximum

efficiency at each point. Operation in a 500° F ambient does not change its physical properties. It is the only bronze pump that can be welded or overlaid—Ampco-Trode 10 electrode matches the base metal perfectly.

Actual performance records prove the value of this pump in breweries, and in petroleum, chemical, and food processing industries. See your nearby Ampco engineer for full details. All sizes are available either pedestal-mounted, or close-coupled to a face-type motor. Write for bulletins.

Ampco Metal, Inc.

Dept. P-9 • Milwaukee 4, Wisconsin



CONTINUOUS PRODUCTION LINE FOR FOAMED RUBBER

The world's largest continuous production line for foamed rubber has been placed in operation at new plant of the Goodyear Tire & Rubber Co., Akron, Ohio, turning out airfoam cushioning for automotive seating and for the furniture and mattress industries.

Airfoam is made by whipping air into compounded liquid latex until the liquid comes to a frothy consistency. It is then poured into molds and cured by hot water and steam. The resultant product contains millions of tiny inter-connected air cells. Liquid latex for the operation is obtained from the Far and Middle East.

REVOLUTIONARY NEW WATTHOUR METER ANNOUNCED BY GENERAL ELECTRIC

A revolutionary new watthour meter that features magnetic suspension of the rotating element has been announced by the Meter and Instrument Divisions of the General Electric Company.



G-E single phase induction watthour meter, Type 1-50-s; front view.

Designated as the Type I-50, the new "floating disk" meter has been designed to give almost a lifetime of trouble-free operation at minimum maintenance costs. A small amount of magnetic material supports all the weight of the disc and shaft, thereby eliminating the need for the jewel bearings that have been a major cause for meter maintenance.

The magnetic suspension element consists of two concentric magnets of cunico, a high-coercive material, which have been placed one within the other. The outer magnet is attached to the meter frame, the inner magnet to the upper end of the disk shaft. The interaction of the two magnetic fields supports the rotating system at a small downward displacement. To keep the shaft in vertical alignment, stainless-steel guide pins are located at the top and bottom. Graphite guide bushings at both ends of the shaft run on these guide pins without lubrication.

Another feature of the I-50 is a new damping system that consists of two small alnico magnets die-cast into the frame, one on each side of the moving element. These minimize side thrust and the tendency to noise and vibration.

(Please turn to page 322)



Workers go for Thom McAn's dress-type safety shoes

Easy on the eyes, easy on the feet! Thom McAn's *dress-type* are the ideal Safety Shoes for light industry, for plant executives and office personnel, and for workers with jobs which do not require heavier types. They combine dress shoe looks with Safety Shoe protection. That's why Thom McAn *dress-type* are a natural for getting more of your men into Safety Shoes and keeping them foot-safe.

And workers go for Thom McAn's low prices, made possible only because Thom McAn's are America's largest selling shoe brand. Easy on the eyes... easy on the feet... easy on the pocketbook! That's why in plant after plant Thom McAn Safety Shoes have helped set foot safety records.

Sold Direct To Plants

\$7.15 net F.O.B. Worcester, Mass. Purchases up to 48 pairs—straight list price. 5% discount on orders of 48 to 144 pairs. 10% discount on orders of 144 pairs and over. Prices subject to change without notice.

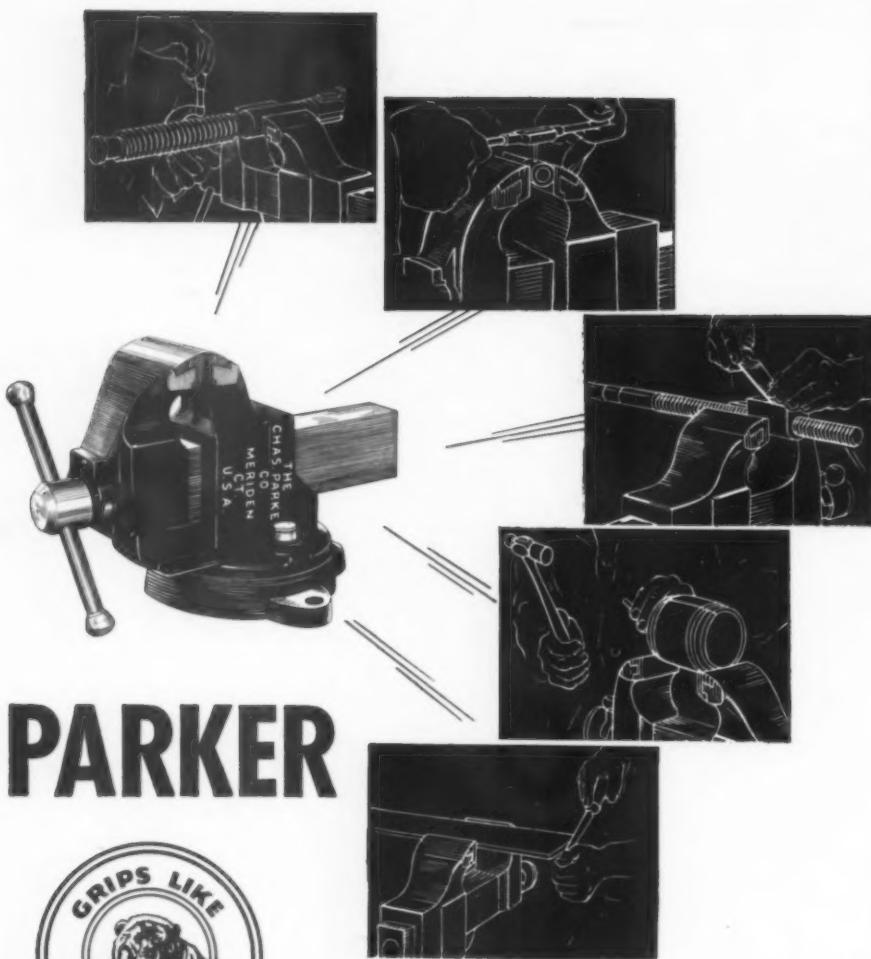
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THOM MCAN—THE SHOE EVERYBODY KNOWS—AND ALMOST EVERYBODY WEARS



PARKER



...and then some!

EVERY CRAFTSMAN expects a solid grip on his vise-held work—and appreciates the "plus" features that Parker Vises provide to make each job faster, better, easier.

For instance, the swivel base, brake-type locking, that swings to hold the work at any point in a 360° circle. Also, the entire top of the vise is covered by renewable steel jaws. When worn or grooved or gouged, just pin-on another set and you have added years of service. The solid-cast underportion of Parkers assure massive strength—and the tension spring handle is non-pinch.

Yes, Parkers are a "lot of vise" for your equipment money—and their extra features pay off in production profits, too. New additions coming soon—a great new line of hinged pipe vises and woodworking vises. Parkers are sold 100% through distributors only. The Charles Parker Co., Meriden, Conn.

NOW—Parkers are packaged—factory-new to you.



PARKER VISES
America's First Vise Maker



(Continued from page 320)

The current coil, with brazed terminals, is molded directly to the core. Butyl rubber, noted for its long-life properties even at high ambient temperatures, provides turn, coil, and ground insulation. The result of this new technique is a securely located current coil that is protected by the rubber from mechanical injury and



G-E engineer points to the magnetically suspended rotating element positioned in the frame of the meter.

abrasion. The potential coil, also molded for greater insulation strength, is encased in a polyethylene plastic of high dielectric strength and low moisture absorption. This new electromagnet design assures long life and calibration stability.

Meters of smaller size and lighter weight result from unit construction, another feature of the I-50.

Additional information on the new watt-hour meter can be found in Bulletin GEC-350 now available at the General Electric Company, Schenectady, 5, N. Y.

1 1 1

TESTING AND RATING HOT WATER BOILERS STANDARD

Commercial Standard CS145-47, Testing and Rating Hand-Fired Hot-Water-Supply Boilers, has been issued by the National Bureau of Standards. It is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 10 cents per copy.

1 1 1

AIR REDUCTION ADDS SOAPSTONES TO SUPPLY LINE

The Air Reduction Sales Company, New York, N. Y., has announced the addition of soapstones to its line of welding supplies.

Soapstones also referred to as talc crayons have many uses in the metal-working field. Oxyacetylene burners use them for sketching the contour of shapes to be cut. Welders use them to mark lap joints and stock handlers find soapstones a necessary item for the marking of sheet metal to be stocked.

Air Reduction will market a 3/16" x 1/2" x 5" long soapstone packaged one gross to a carton. Unless specified on an order for other materials these soapstones will be sold in a minimum quantity of 6.

(Please turn to page 324)



free

new, informative
BOOKLET with

- tips
- ideas
- samples

plus NEW WAYS to boost
your sales with PF decals

are you getting
all the advantages
of the 7 basic uses
of decals?

This wonderful, new booklet shows how you can use the valuable advertising space you own, at a very low cost; explains how your name and product can appear in free advertising space, and demonstrates how decals can be used to decorate and beautify a product, regardless of type or size. ✓ ✓ ✓ These and many other valuable uses and advantages of PF decals are fully described and shown in the new PF booklet.

You'll see how other well known firms in your own field use PF decals profitably... yes, actually put them to work... so that often one decal tells and sells for as long as five years without a change. ✓ ✓ ✓ This is one booklet you won't want to miss getting. It covers all phases of the decal field completely. In all probability it has the answer to just that "one question" about decals you've always wanted to know.

Free samples of PF decals are enclosed with the booklet so that you can try them for adherence and ease of application. Notice the bright, "true colors" . the perfect registry and the especially sharp lines of PF decals . . . then visualize your own trade mark on a PF decal. ✓ ✓ ✓ Your business can profit from the 16 information-packed pages in this booklet. Send for your free copy today. Use the coupon below.

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A NIGHT WATCHMAN --CAN'T BE EVERYWHERE

ALL THE TIME!



Let C-O-TWO safeguard your property from fire, even if you have a night watchman on duty. The new C-O-TWO Combination Smoke Detecting and Fire Extinguishing System is a round-the-clock automatic fire watchman. The first trace of smoke in a protected area is drawn through pipes to the smoke detecting cabinet. Immediately an alarm sounds and fast, clean carbon dioxide gas fully floods the stricken area . . . the fire is out before it has a chance to spread and cause extensive damage.

C-O-TWO is non-damaging, non-conducting, non-corrosive and non-contaminating. It is especially suited for electrical equipment enclosures, flammable liquid storerooms and processing areas, record vaults, pump rooms or any other area where a fire hazard exists. C-O-TWO Fire Protection Equipment is designed for quick, positive action the instant fire strikes.



C-O-TWO
INDUSTRIAL SMOKE DETECTING CABINET

Let an expert C-O-TWO Fire Protection Engineer advise you on your fire protection needs now, before fire strikes. Remember . . . tomorrow may be too late. Write us today for your free copy of the booklet, "Kills Fire — Saves Life."

C-O-TWO FIRE EQUIPMENT COMPANY

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Sales and Service in the Principal Cities of United States and Canada
AFFILIATED WITH PYRENE MANUFACTURING COMPANY

COATINGS IN COLOR SIMPLIFY TOOL STEEL IDENTIFICATION

To provide a quick, positive method of identifying steels of different grades, the entire surfaces of matched tool and die steel bars are being painted different, distinctive colors, according to announcement by the Carpenter Steel Co., Reading, Pa. Twelve different colors identify steels in the air-hardening, oil-hardening, water-hardening, and red-hard matched sets. The marking makes identification quick and sure, eliminates confusion in stocking, and simplifies inventory taking. The company is issuing a Tool Steel Selector and Identification Wall Chart, 21" x 31", presenting a 12-color reproduction of the Carpenter matched set diagram and showing the color markings for each tool and die steel.



OL' MAN WINTER IS JUST AROUND THE CORNER



The accompanying illustration shows an 85-ft. long concrete ramp leading from basement to the street, at plant of the Bigelow-Sanford Carpet Co., Inc., Amsterdam, New York, following a snow storm last winter. The ramp is featured by a 10% grade on a 30-deg. turn. Keeping the ramp free of ice and snow was solved by installing a network of pipe coils in the crushed rock fill underlying the 6-in. concrete slab. Hot water, heated by a converter on the plant's steam line is forced through the coils by a pump, keeping the pavement warm and melting the snow as it falls, and preventing the formation of ice. Anti-freeze is added to the water to prevent freeze-up during the non-operating periods. The wrought iron header pipes and supply and return mains are 2", and the grid pipes, spaced on 13½" centers between the headers, are 1½" pipe. With this pipe spacing and an operating water temperature of 130 deg. F., the system is designed to melt snow at a rate of 2 inches per hour. If system is turned on when snow starts to fall, the temperature of the pavement is sufficient to melt the flakes upon contact.



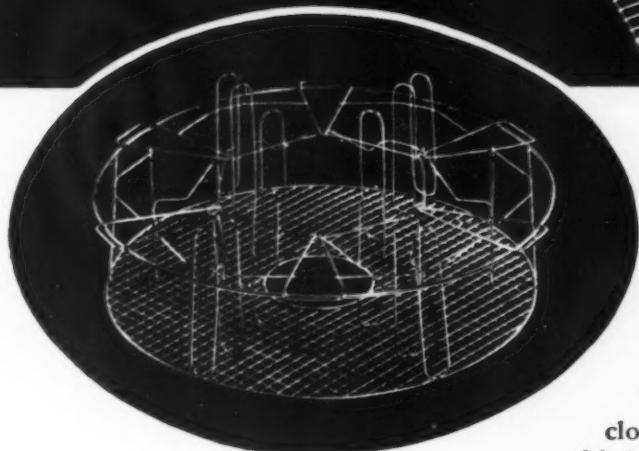
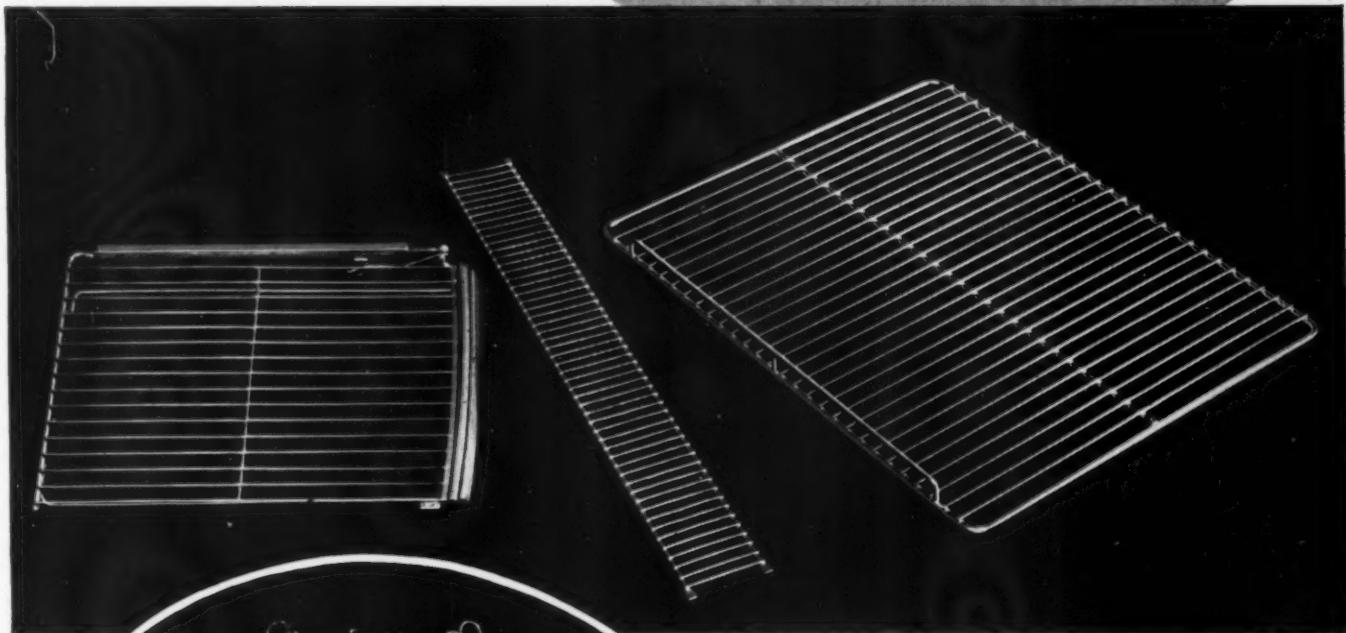
CLAY PIPE COMMERCIAL STANDARD

Commercial Standard CS143047 for Standard Strength and Extra Strength Perforated Clay pipe, prepared by the National Bureau of Standards, Department of Commerce, is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 10¢ per copy.

(Please turn to page 326)

Republic ENDURO Stainless Steel Wire

For Long, Trouble-Free Life . . . For Appearance, Too!



Work-saving appliances get plenty of help from ENDURO Stainless Steel Wire. For instance, refrigerator trays and dishwasher racks made of Republic ENDURO Wire resist rust and corrosion . . . are easy to clean . . . look good . . . give years of trouble-free service.

Fabricators of wire products get help from ENDURO Wire, too. It welds readily. Uniform cross-section, close tolerances and uniformly fine surface finish offer more fabricating short cuts. Painting or plating is unnecessary—economical electropolishing gives ENDURO Wire parts a lasting, lustrous finish.

ENDURO Stainless Steel Round or Flat Wire can be used profitably for cold headed parts, shelving, wire screening and cloth, jewelry, chain, wire rope and cable, brushes, springs, handles, hooks, clamps, rivets, welding electrodes, moulding, utensils . . . and thousands of similar applications. And, both Wire and Free-Machining ENDURO Bars are available for prompt delivery. Write for more information.

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Export Dept.: Chrysler Bldg., New York 17, N.Y.

Republic
ENDURO STAINLESS STEEL



Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

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Serve Many Purposes and Fields of Activity

All are quality products . . . rightly priced . . . rapidly produced. Our Creative Design and Engineering Departments are at your service.

For the latest data and ideas check the items of interest to you.

- Spirally wound Tubes, Cores and Cans.
- All fibre and combination fibre and metal cans.
- Friction plug, slip cover, screw cap containers.
- Paper thread protectors for male threads (tubes) for female threads (plugs).
- Paper discs.
- Kraft and fish paper tubes for coil forms and condenser covers.
- Cosmalite—spirally laminated paper base phenolic tubing for the electrical industry.

Your inquiry will be given immediate attention.

May we serve you?

The CLEVELAND CONTAINER Co.

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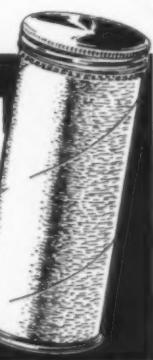
- All-Fibre Cans • Combination Metal and Paper Cans
- Spirally Wound Tubes and Cores for all Purposes
- Plastic and Combination Paper and Plastic Items

PRODUCTION PLANTS also at Plymouth, Wisc., Ogdensburg, N.Y., Chicago, Ill., Detroit, Mich., Jamesburg, N.J.

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CANADIAN PLANT: The Cleveland Container Canada, Ltd., Prescott, Ontario



LIFT TRUCK LADLE SPEEDS GRAY IRON CASTING

Materials handling engineers of The Yale & Towne Manufacturing Company, Philadelphia, working with leading Chicago and Memphis foundrymen have integrated transfer ladle design with modern lift-truck methods of saving time, muscles, and money.

The result is a unit capable of (1) receiving three tons of molten metal directly from the fixed mixing ladle at the cupola, (2) following the ladle lift up and down as the pouring proceeds, (3) rapidly transporting the loads to the pouring ladles at the various casting stations, and (4) filling them as required. The entire operation is performed by one operator who rides the truck and controls all movements from a single position.



The unit receives three tons of molten metal directly from mixing ladle at cupola.

The basic truck, illustrated, is an electric powered 8000-lb high-lift platform type with six steering wheels for even load distribution and minimum turning radius.

The ladle, lined with refractory brick, is permanently mounted on a heavy fabricated skid engaged by the platform of the truck and pinned thereto. The pin is disengaged only when the ladle is delivered to shop for maintenance or relining. While the ladle is working, it is a permanent and integral part of the truck platform. A run of fresh metal into a transfer ladle is made every few minutes, thus making for decided savings in time and operating costs.



SMALL NYLON-COATED ELECTRICAL WIRE

United States Rubber Company is now putting nylon on the smallest electrical wire ever developed for wiring homes, offices, factories, hotels and other buildings.

The nylon forms a hard shell over the rubber insulation, giving the conductors better protection.

The new wire is 30 per cent smaller in diameter than conventional building wire. It takes up less room in conduit, permitting the use of more conductors.

Under the nylon are two layers of insulation—natural rubber and neoprene synthetic rubber. The nylon is hot and liquid when applied over the rubber. As it cools it becomes extremely hard and smooth.

The new wire is claimed to be resistant to gasoline, oil, fire, moisture, acids and light. It will be marketed under the name Neolay Type RU in sizes 14, 12, 10, 8 and 6.

(Please turn to page 328)

Specify STROM BALLS



Hand Gauging
of large diameter
Strom Balls
before packaging

When you specify Strom Balls you are sure of getting balls with the highest obtainable degree of finish, sphericity, precision—balls that give the very highest quality of service in any bearing equipment. This high degree of perfection is the result of Strom's concentration for a quarter of a century on metal balls exclusively and the perfection of the processes and workmanship necessary to produce them. Strom Steel Ball Company, 1850 South 54th Avenue, Cicero 50, Illinois.

Strom BALLS  **Serve Industry**

LARGEST INDEPENDENT AND EXCLUSIVE METAL BALL MANUFACTURER

Tape passes 'acid' test

Another story showing how Bauer & Black
"Specific Tapes for Specific Uses"
save time and money for industry.

PROBLEM: Huge ventilating stacks over steel pickling vats gave trouble to Acme Steel Co. (Riverdale, Ill., plant). The conventional duct connector joining upper and lower halves of the stack used to wear out, in 90 days, from the combined attack of weather, continuous vibration and sulfuric acid fumes. Bauer & Black Industrial Adhesive Tape Engineers provided the

SOLUTION: A new connector was fashioned from Bauer & Black Industrial Adhesive Tapes #263 and #281 and a neoprene-coated, Fiberglas* fabric. Both tapes are made of Fiberglas* cloth and a special *vulcanizable* adhesive. They stubbornly resist deterioration, and their airtight seal *grows stronger with age*. The new connector has now been in place over 9 months, with LITTLE DETERIORATION!

Hundreds of industries have found, like Acme, that Bauer & Black Industrial Adhesive Tapes save time and trouble.

YOU can effect savings or product improvement with "the right tape in the right place." If the tape you need isn't in our catalog, we'll make it! Write Dept. 9-9 today for full information. No obligation, of course.

TAPE EXPERTS IN YOUR AREA!

Each of the following distributors maintains at least one factory-trained specialist to help you with your tape problem.

CALIFORNIA

Hollywood
Reese Supply Co.
Los Angeles
Zellerbach Paper Co.
Latex Co.
Oakland
Zellerbach Paper Co.
San Francisco
Acme Paper Co.

CONNECTICUT

Bridgeport
Equity Paper Co.
Hartford
Rourke-Eno Paper Co.

GEORGIA

Atlanta
The Atlanta Paper Co.

ILLINOIS

Chicago
Abana Products
Knox & Schneider

INDIANA

Evansville
Capital Paper Co.
Fort Wayne
Millcraft Paper Co.
Indianapolis
Capital Paper Co.
Industrial Rubber & Equip. Co.
South Bend
Feltz-Kaufer Paper Co.

KENTUCKY

Louisville
Rowland Paper Co.

LOUISIANA

New Orleans
Stevens-Band Paper Co.

MARYLAND

Baltimore
Hubbs & Corning Co.

MASSACHUSETTS

Cambridge
H. J. Dowd Co., Inc.

Springfield

Carter Paper Co.

Worcester

Industrial Papers Inc.

MISSOURI

Kansas City
Wertgame Paper Co.

ST. LOUIS

Smith-Scharff Paper Co.

NEBRASKA

Omaha
Nogg Bros. Paper Co.

NEW JERSEY

Newark
General Paper & Twine Co.

PERTH AMBOY

E & B Mill Supply Co.

NEW YORK

Buffalo
Hubbs and Howe Co.

NEW YORK

Charles F. Hubbs Co.
Leeds Sales Inc.
Robert Spector Co.

ROCHESTER

Hubbs & Hastings Paper Co.

SYRACUSE

Hubbs & Hastings Paper Co.

NORTH CAROLINA

Charlotte
Southeast Utility Products

OHIO

Cincinnati
Chattfield Paper Corp.

Cincinnati Cordage & Paper Co.

CLEVELAND

Hubbs and Howe Co.

COLUMBUS

Cincinnati Cordage & Paper Co.

DAYTON

Cincinnati Cordage & Paper Co.

TOLEDO

Ohio & Michigan Paper Co.

OKLAHOMA

Oklahoma City
Carpenter Paper Co.

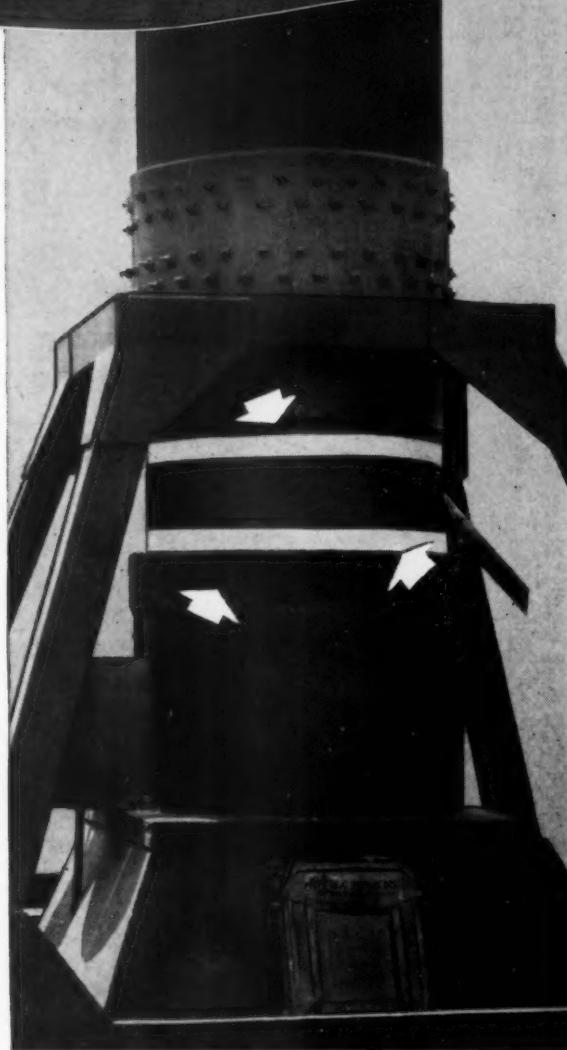
TULSA

Tulsa Paper Co.

OREGON

Portland
Van Waters and Rogers, Inc.

Products of



*Fiberglas (Reg. U. S. Pat. Off. by Owens-Corning Fiberglas Corp.)

PENNSYLVANIA

Erie
Hubbs and Howe

PHILADELPHIA

Terminal Paper Co.

J. L. N. Smythe Co.

PITTSBURGH

Interstate Cordage & Paper Co.

TENNESSEE

Memphis
Mayer Myers Paper Co.

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Dallas
Carpenter Paper Co.

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Carpenter Paper Co.

WASHINGTON

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Dwight Bros. Paper Co.

W. H. Kranz Co.

RACINE

W. H. Kranz Co.

CANADA

Toronto
Victoria Paper & Twine Co. Ltd.

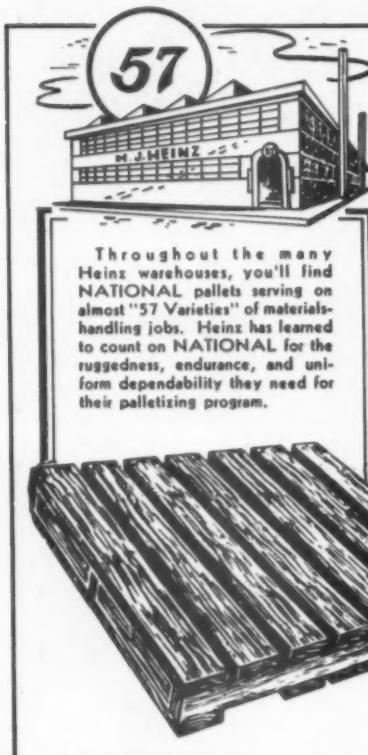
BAUER & BLACK

Division of The Kendall Company • 2500 S. Dearborn St. • Chicago 16

Industrial Adhesive Tape

PRESSURE SENSITIVE

Production Short Cuts to Reduce Costs • Research to Speed and Improve Methods



Throughout the many Heinz warehouses, you'll find NATIONAL pallets serving on almost "57 Varieties" of materials-handling jobs. Heinz has learned to count on NATIONAL for the ruggedness, endurance, and uniform dependability they need for their palletizing program.

**57 Varieties of Food
but only 1 make of Pallet**

H. J. HEINZ COMPANY
**SPECIFY RUGGED
NATIONAL
PALLETS and SKIDS**

Especially in food plants—dependability of the pallet supplier is a 'must.' For there may be "57 Varieties" of materials-handling problems and a different type of pallet required for each type. So Heinz now specifies one make of pallet—NATIONAL—the oldest and largest pallet manufacturer in the country. They know the name NATIONAL means dependability.

**NATIONAL
PALLET CORPORATION**
MAIN OFFICES OLIVER BLDG., PITTSBURGH 22, PA.

Let NATIONAL help you in your palletizing program too. Our plants, throughout the country's hardwood sections, enable you minimum shipping costs on large nation-wide programs.

Send for NATIONAL'S pallet catalog—or ask for a representative to call on you.



CULLMAN Stock Design SPROCKETS
will do the job—Better!

With many types to select from — you are almost certain to find just the size you need for practically every transmission requirement — ready for immediate delivery. Cullman Sprockets—produced by fast, low-cost, high-precision methods—assure top operating efficiency. "Specials," too, are quickly available—made up by exclusive Cullman methods and specialized equipment.

CULLMAN WHEEL COMPANY
1352 P Altgeld Street

Write today for free catalog containing useful data and helpful facts for sprocket users. It lists dimensions.



STANDARD FOR STOCK DOORS ANNOUNCED

Commercial Standard CS73-48 for Old Growth Douglas Fir, Sitka Spruce, and Western Hemlock standard stock doors has been issued by the National Bureau of Standards. This recorded voluntary standard of the trade is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. at 15 cents a copy.

1 1 1

POCKET ELECTRODE GUIDE

The publication of a new pocket guide to Airco arc welding electrodes, is announced by Air Reduction Sales Co., 60 East 42nd St. New York, N. Y. The guide presents all the facts pertaining to the most commonly used Airco electrodes along with helpful data regarding the factors to be considered when choosing an electrode for a specific job. The guide, 4" x 8", is thumb-indexed for ready reference. Section titles include mild steel, high tensile steels, hydrogen weld metal, stainless steels, surfacing, non-ferrous and cast iron.

There is also an electrode-selection table which gives the operator complete information on which electrode to use for a particular job, its chemical analysis and mechanical properties.

The guide also features a two-page NEMA standard color chart and an electrode comparison chart which matches up the various electrodes on the market with their respective AWS and ASTM classification.

1 1 1

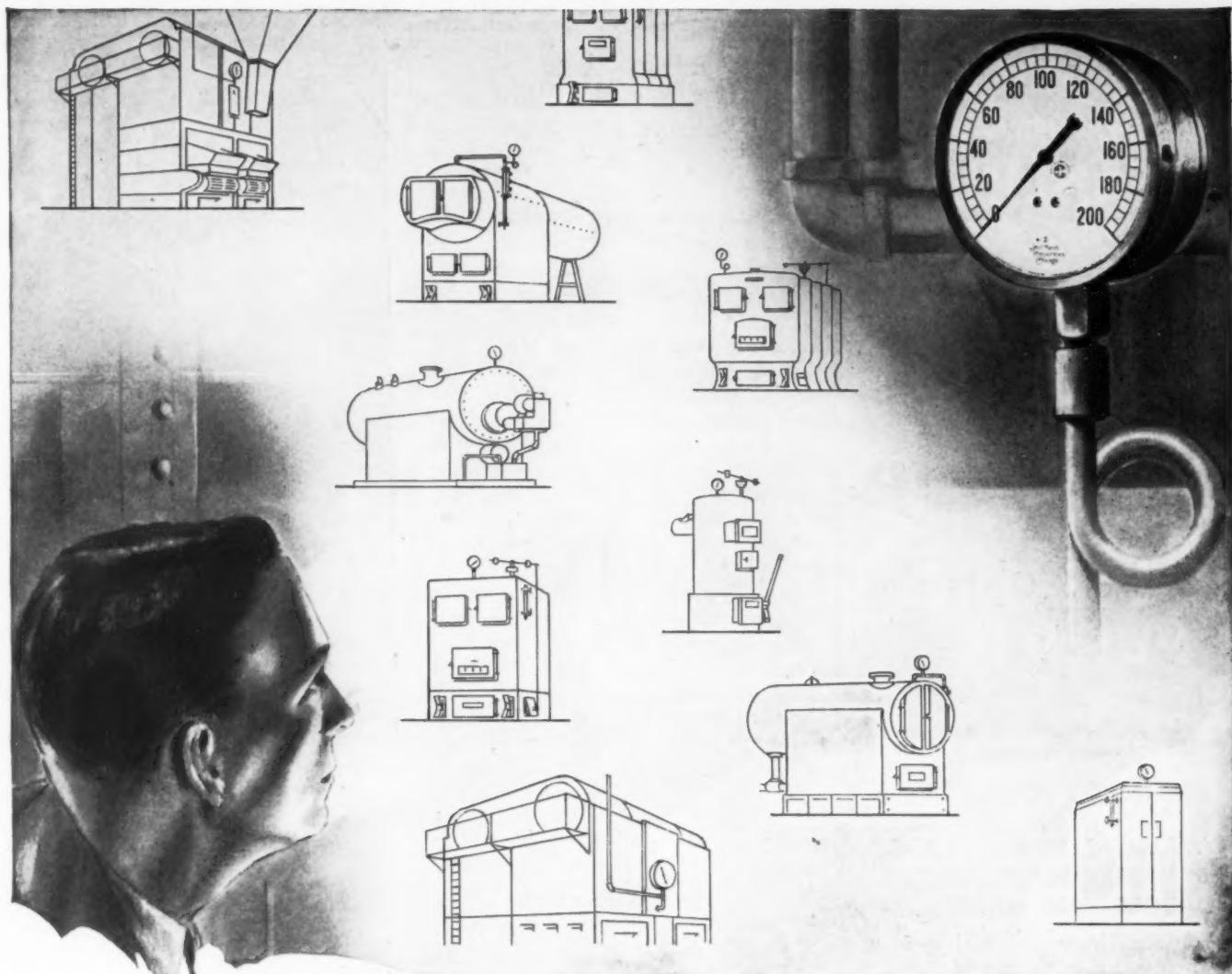
NICHOLSON ANNOUNCES NEW G. P. MACHINIST'S FILE



Single cut teeth, divided by angular serrations, create versatile tool capable of roughing and finishing various metals.

Nicholson File Company, Providence 1, Rhode Island has announced a new general-purpose file for use on aluminum, bronze, cast iron, mild steels or annealed tool steels. Teeth in the new file are single cut, like a regular Mill Bastard file, but are divided by angular serrations. These produce shorter cutting edges, and break up the filings. The new design is said to cut faster than a single cut, and finish smoother than a double cut.

The file has the shape of a regular Flat file, except that it does not taper in thickness. It comes in 8", 10", 12" and 14" lengths.



... Way out in front in the boiler field

● Yes, a large majority of boiler manufacturers use Marsh pressure gauges. Marsh is out in front in every branch of this big industry—low pressure, high pressure, cast iron, fire tube, self-contained, water tube—from the smallest up to the largest.

In current trade directories, more than 65% of the boiler manufacturers listed equip their product with Marsh Gauges; and while actual boiler production figures are not available, this particular 65% of the boiler manufacturers unquestionably do, by the most conserva-

tive estimate, over 80% of the world's boiler business!

Here is a remarkable tribute to the lasting accuracy of Marsh instruments by men who use gauges in large quantities—men who know pressure gauges forward and backward. Yet it is only one example of the preference shown in many fields by manufacturers of products in which accurate pressure indication is vital.

Keep this in mind when you buy pressure gauges. Use the instruments that are preferred by the most discriminative users of pressure gauges . . . *Marsh*.

Jas. P. Marsh products include: A full line and range of gauges in pressure, compound, altitude, hydraulic, sprinkler, ammonia, ounce-graduated retard, test, and diaphragm types. Dial thermometers in rigid stem and remote reading types. A broad line of steam and hot water heating specialties. Ask for literature.



JAS. P. MARSH CORPORATION
Dept. G, Skokie, Illinois

MARSH GAUGES





All Purpose
CLEANING COMPOUND

FOR
**WALLS, FLOORS, WOOD-
WORK, REFLECTORS,
DADOES AND MACHINERY**

You save both time and money when you use job proven Elektro Purj-It in your plant cleaning. Scientifically developed to dissolve quickly in water, it actually costs less than 2 cents per gallon. Efficient and quick to penetrate, it loosens dirt and grease. Dustless and non-caking, Elektro Purj-It is the ever growing choice of industrial plants everywhere.

**PROVEN BEST BY
FACTORY TESTS**

*Send for your
FREE SAMPLE*

Prove it for yourself. Select a tough cleaning job in your plant and let Elektro Purj-It go to work for you. It deodorizes as it cleanses.

THE DIVERSEY CORPORATION
Industrial Maintenance Department
53 W. Jackson Blvd. Dept. P-9
Chicago 4, Illinois

**Misconceptions of Public
Purchasing**

(Continued from page 141)

to help advance the cause of fair competitive bidding on public business.

Buying Branded Products

As a corollary, we often hear the argument that private business could not survive if it resorted to the elaborate buying methods of public agencies. Here again, the critics forgot the difference between the two buying agencies. Whether the private purchaser does a "better" buying job is not only irrelevant, but it is not susceptible of direct comparison and measurement. He buys for a profit-making enterprise. The public buyer does not. The public buyer is less concerned about re-sale values than the private buyer. He does not have to consider as a vital factor whether the goods are well merchandised, because he does not have to make money on the deal. In fact, there has been altogether too much pussyfooting about the sale of branded products to public agencies.

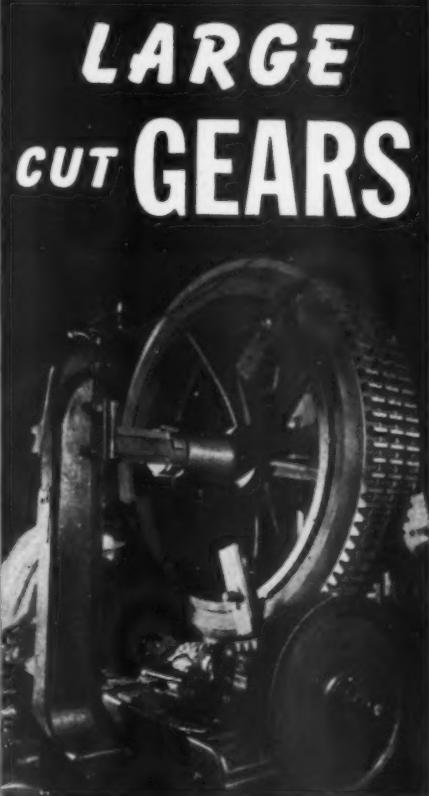
Despite the fact that the most popular branded items are to be found in public agencies from Coast to Coast, there are still those who mumble that a branded item cannot compete successfully on a "lowest" price basis because it has quality. The argument completely ignores the standards of public buying. The NIGP survey showed that 193 governmental agencies that responded to the question, spend \$49,000,000 annually on a "broad or equal" basis. That means that the branded items are on an equal footing. And, of course, the use of a specification is no bar to branded items. Patented items are bought daily, despite all provisions for competitive bidding.

Despite all its idiosyncrasies, public buying is ruled by reason. It may need tuning up, but its concepts are soundly planted in the public interest, which is to say the whole public, including competitive business which is the artery of our economy.

Competitive Selling

That public purchasing agents recognize the importance of methods that do not discriminate is proved over and over by the continual search they make for specifications that will assure widest possible competition. The NIGP is never without appeals from all over the country for advice on specifications that will achieve just that objective. One help

(Please turn to page 332)



Cutting three identical spur gears simultaneously at Simonds Gear.

**Cut Gears
for Industrial Needs!**

For special gears in larger sizes—exact duplicate gears for replacements—for every heavy-duty industrial gear application—look to **SIMONDS GEAR** where specialty gears for heavy industry have been a custom service for more than 50 years. Within easy shipping distance of many heavy industry plants—with a personalized service designed to meet your most exacting specifications—**SIMONDS GEAR** provides an unusually prompt and efficient service on even the most unusual gear requirements. Sizes range up to 145" dia. in all popular gear-making materials. Send your inquiry today and get acquainted with **SIMONDS GEAR** Service.

SPUR GEARS

BEVEL GEARS • MITRE GEARS

WORMS • WORM GEARS

RACKS • PINIONS

Stock carrying distributors for Ramsey Silent Chain Drives and Couplings. V-Belts.

SIMONDS GEAR & MFG. CO.
LIBERTY at 25TH PITTSBURGH 22, PA.



Wise money rides on the champ

THE odds favor the champion. The champion got to the top by fighting his way there, by beating all challengers. That's why, in each new battle, the wise money is placed on the champ.

The champion has a record of successes; he has wise handlers who carry him through to *more* successes.

For this same reason, it does not pay to play hunches in your selection of alloy steels. Carilloy steels have a record of exceptional performance under all kinds of unusual conditions. And Carilloy's handlers — the Carilloy metallurgical engineers — are recognized authorities in the field of alloy steels.

When these engineers size up the job you have to do, they bring with them

years of experience in the highly specialized field of alloy steel application. And they play no favorites because they have a complete list of fine alloy steels to pick from—bearing steels, aircraft steels, gear steels, Nitralloy steels, high temperature steels and low temperature steels, regular and special analysis steels of every kind. In any form and in any size.

So if your job requires the unusual in strength, toughness, durability, stamina, fabricating qualities — get their expert opinion. They'll help you pick the alloy

steel that's right for the job and that you can put your money on with confidence.

U·S·S Metallurgical Engineers and the outstanding research organization behind them have played a leading part in the development of the triple-alloy NE steels, and in the inception and introduction of hardenability bands, isothermal transformation studies, and new and improved heat treating methods. Through constant research and experiment these experts are continually expanding the usefulness and efficiency of special steels for the special jobs of industry.

CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH AND CHICAGO
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



Carilloy Steels

ELECTRIC FURNACE OR OPEN HEARTH
COMPLETE PRODUCTION FACILITIES IN CHICAGO AND PITTSBURGH

UNITED STATES STEEL

This
FREE BOOK
shows how to save
on NAME PLATES

Over 4500 shapes and sizes of name plates for which we have dies in stock are shown in this book. By choosing one of these designs you can effect a material saving. If you or your Engineering Department can make use of

it write us now for a copy of "Designs for Name plates" . . . ECOA quality is enduring. Your request for a quotation is solicited—you will receive a prompt reply.



ETCHING COMPANY OF AMERICA

1520 MONTANA STREET, CHICAGO 14, ILLINOIS, DEPT. C-9

Metal Name Plates, etched or lithographed • Plastic Name Plates, Dials and Panels, lithographed or screened • Etched Metal Scales, Clock Dials, Instrument Panels, Art Novelties, Advertising Specialties • Etched Metal Panels for elevators and architectural uses.

SUBSIDIARY OF DODGE MFG. CORPORATION, MISHAWAKA, INDIANA

Misconceptions of Public Purchasing

(Continued from page 330)

that industry can give is to bid on public offerings.

Failure to understand the problem that confronts the public buyer leads to a host of additional misconceptions. To cite but one, I can point to my own experience in the New York City Board of Education. Salesmen sometimes presented their stories to individual school principals. When the item was requisitioned, the salesman felt that his job was finished. He often believed that the purchasing agent would, or should, order exactly the item that was requisitioned, completely ignoring the whole principle of competitive bidding. Of course he was disappointed. He misunderstood his part in the selling process because he failed to understand the difference between a public and private purchase. His energies would have been far more effectively used had he seen to it that his items were represented by bids when we advertised for them. Or, if his concern had not been invited to bid, his job was to do what he could to see that it was included on the bidders list, assuming of course that the concern was responsible and had a competitive item.

Where does all this lead us? For one thing, it leads us to the conclusion that simple candor, efforts at mutual understanding, and a resolve to try to comprehend our mutual problems will dissolve many misconceptions. It is not at all beyond the realm of possibility that we may be going into an era of more intense competition. If we do, the need for cooperative effort to raise the standards of public buying will be even greater, for the best public interest will be served through open competition and efficient buying methods in public agencies. The public purchasing agents are sold on this. The sellers can do their part and we hope they will.

Following the Order

(Continued from page 96)

Much as the practice is used, and time saving as it may be presented, it is difficult to erase in the mind of the recipient, the impression that it is stereotyped, and stock. It is like an old phrase, and although old phrases have solidity, the feeling of urgent particular interest that the separate letter gives is far superior.

(Please turn to page 334)



STAINLESS STEEL Seamless and Welded TUBES with Molybdenum for superior corrosion-resistance and strength

When production processes call for tubes with high resistance to severely corrosive solutions, call on these B&W Croloys 111111

They were developed by B&W expressly to help solve this problem . . . so they meet the requirement as only tailor-made tubes can.

Because of their molybdenum content, all of these Croloys are superior to many of the plain stainless grades, not only in combating corrosion, but also in their resistance to creep and oxidations at elevated temperatures. Their time-saving, cost-cutting advantages have been convincingly demonstrated in a wide variety of severe service conditions.

B&W can supply these Croloy analyses in both seamless and welded tubes. Perhaps they will solve tough tubing problems in your plant or in equipment you make, as they have in others. So ask today for full information.



TA-14535



Seamless and Welded Tubular Products in a full range of Carbon, Alloy, and Stainless Steels for All Pressure and Mechanical Applications.

★ ★ ★

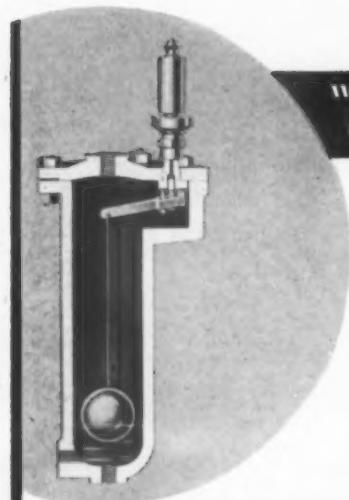
Other B&W Products

THE BABCOCK & WILCOX CO.
85 LIBERTY STREET - NEW YORK 6, N.Y.

Stationary and Marine Boilers . . . Boiler Components . . .
Pulverizers . . . Fuel Burning Equipment . . . Refractories . . .
Chemical Recovery Units . . . Process Equipment . . .
Alloy Castings.

BABCOCK & WILCOX SEAMLESS & WELDED TUBES

THE BABCOCK & WILCOX TUBE COMPANY
GENERAL OFFICES: BEAVER FALLS, PA.
PLANTS: BEAVER FALLS, PA. AND ALLIANCE, OHIO.



"BROWNIE" LOW WATER SIGNAL

Note How
all internal parts are
attached to cover.

Simple to install, effective in operation, low in cost—that is the "Brownie" story in plain language.

Performance records indicate that a "Brownie" seldom needs attention aside from periodic blow-offs. Removal of cover, with all operating parts attached to it, permits complete inspection without removing the "Brownie" from the line. Convenient? Well, our customers say it is.

*Get them at your supply store
or send for Bulletin 570-B.*

WRIGHT-AUSTIN COMPANY
337 W. Woodbridge St., Detroit 26, Michigan



WRIGHT-AUSTIN

SERVING INDUSTRY FOR MORE THAN 50 YEARS

ARMSTRONG-BRAY



The Correct Fastener for Any Belt

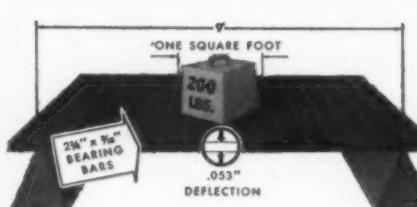
There is a best type of fastener for every type of belting, for every load, for every working condition. That is why ARMSTRONG-Bray makes not one but all approved and accepted types: WIREGRIP Belt Hooks, STEELGRIP Belt Lacing, PLATEGRIP Belt Plates (for joining and repairing heavy conveyor belts) and SUREGRIP and FLEXGRIP couplings for Round Belting. Standardize on ARMSTRONG-BRAY products and have the right fastener for each application.

Write for Catalogue

ARMSTRONG-BRAY & CO.
5368 Northwest Highway, CHICAGO 30, U.S.A.

For STRENGTH specify

TRI-LOK RECTANGULAR OPEN STEEL FLOORING



The locked-in strength of Tri-Lok enables it to stand up under heavy loads—even on long spans. No rivets, bolts, or welds are used in the construction of Tri-Lok; this feature eliminates the possibility of loose joints.

Tri-Lok is also available in Diagonal, or Super-Safety U-type Flooring, and in Stair Treads of all types. Write for Bulletin KP 1140.

DAVO CORPORATION

National Distributor for the
Tri-Lok Company

Dravo Bldg., Pittsburgh 22, Pa.

Sales Representatives
in Principal Cities



Following the Order

(Continued from page 332)

If tracers and suppliers are handled properly, there will not be so many of these letters that they would run into quantity.

Part of the job of following the order is marking all delivery information on the copy of the order, and also marking, from receiving reports, the dates and quantities of material received. From the receiving department or inspection department should also be reported any defective material, shortages, overages, or incorrect material. Disposition should be carried out by the purchasing department with the supplier, by letter or telephone in an amicable, equitable, manner.

No one ships incorrect or defective material purposely, and the vendor is only too glad to correct the difficulty, for to remain in business demands accurate and exemplary performance. It is therefore unnecessary to fly into a rage, but only to indicate the trouble, and the fault can be ironed out. Correction and replacement is merely following the order a little farther than originally thought necessary.

Orders should be followed every day, and in the ultimate is like taking the count of the pulse, a ready means of appraising the condition, and the efficient means of learning the need for any impetus into the steady stream of incoming materials.

Good Citizenship

(Continued from page 89)

ties, can be of great value in all of these community interests. And the time to start cultivating and contributing our services to them is as young men.

Yes, it takes time outside of business hours, but it also provides breadth in our thinking and stability in our community—and it makes good citizens. Participation in such "outside" activities returns to the individual a reward in personal satisfaction that cannot be measured by any yardstick. It provides relaxation, too, from your own crowded business life of these times.

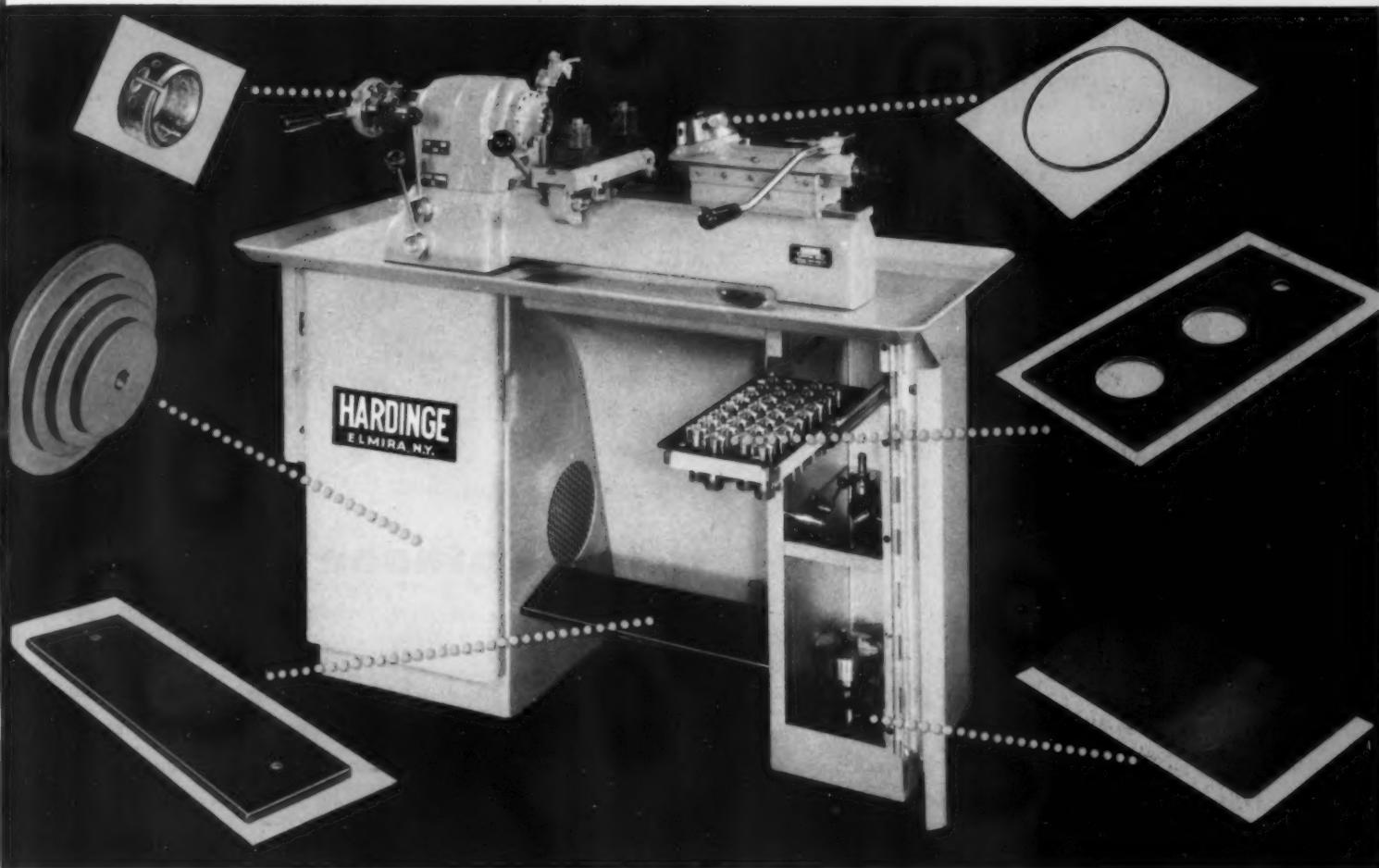
Our Association is dedicated primarily to our profession as buyers. It will grow in strength and interest only as we individually grow in our usefulness to and support of our employers and our community.

Plastics where plastics belong for strength, light weight; wear resistance and anti-frictional qualities.

Most important of Synthane's advantages is its unusual combination of chemical, electrical and mechanical properties.

Structural strength, moisture and corrosion resistance and light weight are only a few of these characteristics that fit Synthane for so many applications. An excellent electrical insulator, our type of laminated plastics is hard, dense, durable, quickly and economically machined . . . it's the set plastic, stable over wide variations in temperature.

Synthane's versatility is demonstrated by its use for seven different parts and purposes in this Second Operation Machine.



The High Speed Precision Second Operation Machine (above), plays an important role in the high speed finishing of automotive accessories, aircraft fittings and fine instrument parts. In the rotating members especially, Synthane's light weight means quicker starting and stopping and higher speeds with less friction.

If these few of Synthane's many properties suggest its use in your product, let us help you with design, materials or completely fabricated parts. Write today for complete Synthane plastics catalog. 7 River Road, Oaks, Pa.

SYNTHANE
S

where Synthane belongs

DESIGN • MATERIALS • FABRICATION • SHEETS • RODS • TUBES
FABRICATED PARTS • MOLDED-MACERATED • MOLDED-LAMINATED

Against these Common Corrosives



you're safer with Synthane

A desirable property of SYNTHANE Laminated Plastics is the ability to withstand comparatively high concentrations of many common corrosives over long periods of time. While not 100% corrosion proof, SYNTHANE is used in hundreds of applications because it often retains its shape, size, and strength for a longer time, and has a longer life per dollar invested, than other materials.

Parts fabricated from SYNTHANE resist the action of cor-

rosive waters and atmospheres, chemical salts and solutions, gasoline and other petroleum products. In addition, SYNTHANE is light in weight, mechanically strong, an excellent electrical insulator and easy to machine.

If these properties suggest new uses for SYNTHANE let us help you before you design; we may be able to save you time, trouble and money. Send for your free copy of the SYNTHANE Plastics Catalog. Use the handy coupon.

SYNTHANE CORPORATION, 7 River Road, Oaks, Pa.

Gentlemen:

Please send me without obligation a complete catalog of SYNTHANE technical plastics.

Name _____

Company _____

Address _____

City _____

Zone _____

State _____



SYNTHANE



PLAN YOUR PRESENT AND FUTURE WITH SYNTHANE TECHNICAL PLASTICS · SHEETS · RODS · TUBES · FABRICATED PARTS · MOLDED-LAMINATED · MOLDED-MACERATED

for more answers on plastics

THAT GEAR IS BUILT AROUND A



A dished head-shape forms the web of this crank gear.

Formerly a casting, this gear is now built up by welding a rolled steel rim around a Lukens Dished Head-Shape, adding the one-piece hub and crank forging, and then cutting the teeth. Being a plate product, it is strong, dependable and inherently free from blowholes and other defects.

Lukens supplies the steel plate web for this gear, a head-shape, already formed as you see it here. The press manufacturer starts to work, therefore, on a semifinished product, applying his labor and machinery to finishing operations. Thus the use of Lukens Head-Shapes helps him speed production while also practically eliminating scrap losses.

Designers interested in the use of Lukens Head-Shapes will find 3,868 different styles and sizes described in Lukens Manual No. 1.

Tire curing press built by The McNeil Machine & Engineering Company of Akron, O. Its dome-shaped steam box also started as a Lukens Head-Shape.

"Flanging and Pressing". Select the shape meeting your needs, transfer its dimensions to your drawing and you've taken the first big step toward important savings in time and money.

For a copy of this manual, or for "Heads in a Hurry" listing the carbon steel heads ready for immediate shipment, write Lukens Steel Company, 415 Lukens Bldg., Coatesville, Pa.

Visit us at the Shows!

Booths 9 and 10
The National Chemical Exposition
Chicago Coliseum
October 12 thru 16



Booth 320
National Metal Exposition
Convention Hall, Philadelphia
October 25 thru 29

LUKENS

HEADS



FOUR INCHES TO OVER TWENTY FEET IN DIAMETER

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

For wiping and polishing



Kimwipes* new industrial tissues

At last! A new, efficient cleaning material for a myriad of special wiping uses. Soft, fresh KIMWIPES* industrial wiping tissues. Easy to handle—quickly disposable. KIMWIPES remove the smallest shavings around machined parts without scratching. Recommended for use on all highly finished surfaces. So absorbent, they blot up 16 times their own weight in liquids.

With KIMWIPES, you can use a clean sheet for each operation. They're safer because when you throw away the used tissue, all grit and foreign matter are disposed of. Useful in machine shops, packing rooms—almost any type of business. For full details and the name of the KIMWIPES distributor nearest you, write us on your letterhead. Kimberly-Clark Corporation, Creped Wadding Division, Neenah, Wisconsin, U.S.A.



Automatic
serve-up
packages

Kimwipes*
INDUSTRIAL WIPING TISSUES

*Trademark

YOUR GEARS...



... produced
**EFFICIENTLY,
ECONOMICALLY**

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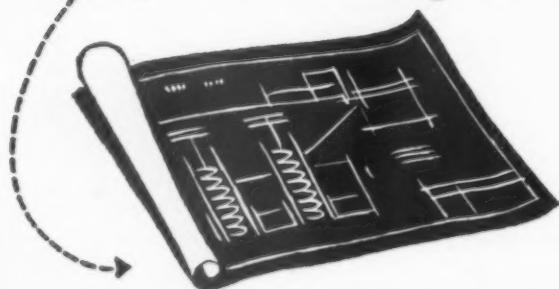
Write us today for booklets describing our standard line of SAE yoke and rod ends, container handles and knife blades, etc.:—and send us your inquiries for custom drop forgings.

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NEW JERSEY

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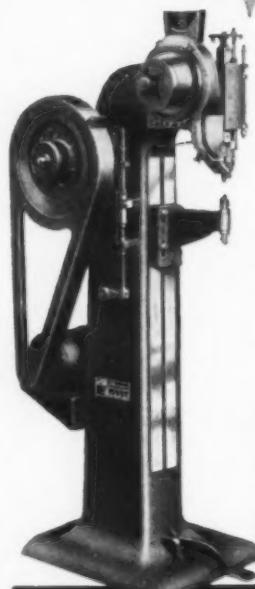
Before you specify the springs or wireforms for your new products, call in a Lewis Spring Engineer to help you select the most practical, economical springs for the job to be done. Lewis engineers have saved manufacturers thousands of dollars by recommending equally effective, but more economical springs than the ones originally specified. They are thoroughly experienced in all phases of spring design, manufacture and applicability to products and welcome the opportunity to help you with spring problems.

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"Originators of the Corrugated Can"

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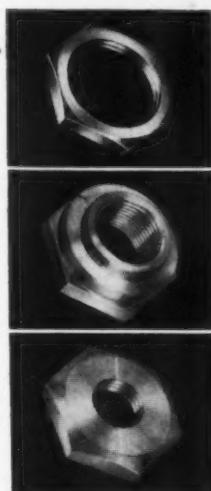
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LETTERS . . .

REACTIONS ALL GOOD

The Ford issue has been out long enough now for some reaction to find its way back to us, and I wanted you to know that it is all good. My own opinion is that it is one of the most comprehensive, intelligent and readable analyses of a business organization of any kind that I have ever read.

My congratulations and my compliments to you for an extremely fine job.

C. F. Unruh, General Purchasing Agent
Ford Motor Company
Dearborn, Michigan

GREAT UNDERTAKING

A great undertaking . . . the profession owes a debt of gratitude to you. We who have been in this field for a good many years know just how much work you are doing, and your efforts have helped very materially in bringing the profession up to its present standard and the recognition it is now receiving. Purchasing in almost all companies today is a part of management.

W. H. Wenzel Director of Purchases
Twin Disc Clutch Company
Racine, Wisconsin

THE FINEST THING

It is the finest thing that has come into this office in years.

G. J. Cronin, Commissioner and Purch. Agt.
The Commonwealth of Massachusetts
State House
Boston 33, Massachusetts

A MODEL

I quite agree that thousands will use this issue as a reference and a model in respect to purchasing methods. You can rightfully be proud.

Carl Ilgenfritz, Vice Pres., Purchases
United States Steel Corporation of Delaware
Pittsburgh 30, Pa.

AMAZING

Outstanding . . . it is interesting and amazing that a company as large as the Ford Motor Company would even permit the issuance of so much information.

You have done what, we believe, would be the outstanding magazine publication job of the year.

J. K. Chambers,
Chief Clerk & Dist. Purch. Agt.
Alcoa Mining Company
Rosiclare, Illinois.

WITHOUT EQUAL

I think that it has no equal in purchasing literature.

Maurice G. Postley, Publ. Rel. Coun.
National Institute of Governmental Purchasing
New York 7, N. Y.

A DISTINCT LIFT

You and your staff are to be congratulated on having given the purchasing function a distinct lift.

John K. Conant
American Viscose Corp.
Philadelphia 3, Penna.

NOTEWORTHY, OUTSTANDING

A noteworthy job . . . an outstanding achievement not only from the point of view of the Ford story, but also because of the huge volume of labor, the preparation and publishing of a book of this size must have cost you and your organization.

H. Meyer, Direct. of Purchases
General Bronze Corp.
Garden City, N. Y.

TRAINING GUIDE

Should find extensive use as a basis for many profitable in-training meetings of purchasing divisions, as well as being the subject of discussion at forums of our various purchasing associations. Certainly, it is my intent to use it in our company in that way. You have performed a very useful service.

F. Albert Hayes, Director of Purchasing
Bigelow-Sanford Carpet Company, Inc.
New York 16, N. Y.

OF INESTIMABLE VALUE

Of inestimable value both to the Purchasing Agents Association of Montreal and to me personally. It is my intention to make it available to the chairmen of our Research Clinic and Educational Committees for discussion purposes.

C. E. Stiles, President
Purchasing Agents Association of Montreal
Montreal, Canada

WILL SERVE AS A GUIDE

I feel confident that a lot of industrial purchasing procedure will use Ford's set-up as a basis for revising their system.

Chester M. Bell, President
Purchasing Agents' Association of Buffalo
Buffalo, New York

MOST INFORMATIVE

The story of the Ford Motor Company's purchasing function, as portrayed in your highly regarded magazine, is a most informative piece of work well done.

J. M. Sitler, Director of Purchases
Standard Oil Company
New York 18, N. Y.

FORD MAN LEARNS ABOUT FORD

We wish to congratulate PURCHASING on the very splendid accomplishment. One of the Ford men, whose picture appears in the issue, told us today that he had learned from PURCHASING facts about Ford Motor Company with which he previously was unacquainted.

Herbert G. Franz, President
Herbert G. Franz Company
Chicago 6, Illinois

A "MUST"

I consider this edition a "must" for any purchasing executive and it certainly will be of permanent value to anyone in the purchasing field. We also plan to discuss some of the articles in this edition at our Association meetings. I am sure much can be gained from these articles.

H. A. Nichols, President
Purchasing Agents Association of
Eastern Indiana

A TEXTBOOK

It is virtually a text book on purchasing. This is the finest contribution that any magazine has made to purchasing.

G. W. Leep, President
Mississippi Association of Purchasing Agents

FINEST TESTIMONIAL

It is one of the finest testimonials I have seen given the Purchasing Profession.

Donald H. Lyons, Purchasing Agent
Johns-Manville Corporation
New York 16, N. Y.

OF GREAT BENEFIT

Of great benefit to the purchasing profession.

M. H. McNeal, Purchasing Agent
Weirton Steel Co.
Weirton, W. Va.

IMPRESSIVE DOCUMENT

It is one of the most impressive documents I have ever been privileged to see. It shows the tremendous influence of purchasing factors throughout industry as a whole.

R. N. Arndt,
John Falkner Arndt & Co.,
Philadelphia

TEXT FOR STUDENTS

My usual practice is to receive PURCHASING after our P.A. has gone through each issue. This time he insists on keeping the July Ford Number! So please send me a copy as soon as possible. I want it to use as text material for my students in Industrial Purchasing at RPI.

Frank Coolsen, Professor of Marketing,
Rensselaer Polytechnic Institute,
Troy, N. Y.

FINEST YET

. . . finest piece of work done to date by any publisher.

W. W. French, Director of Advertising
and Sales Promotion,
Dodge Manufacturing Co.,
Mishawaka, Ind.

IDEA SOURCE

It was of great interest to note how a purchasing department in a company as large as Ford really functions. I have received several good ideas from it . . . Whether we purchase for a large or small concern, we can derive great benefit from it.

F. J. DeCrane, Pur. Agt.,
The Lamson & Sessions Co.,
Cleveland

CONGRATULATIONS

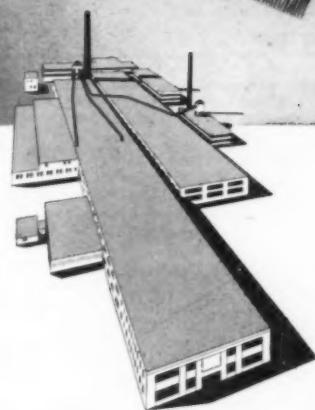
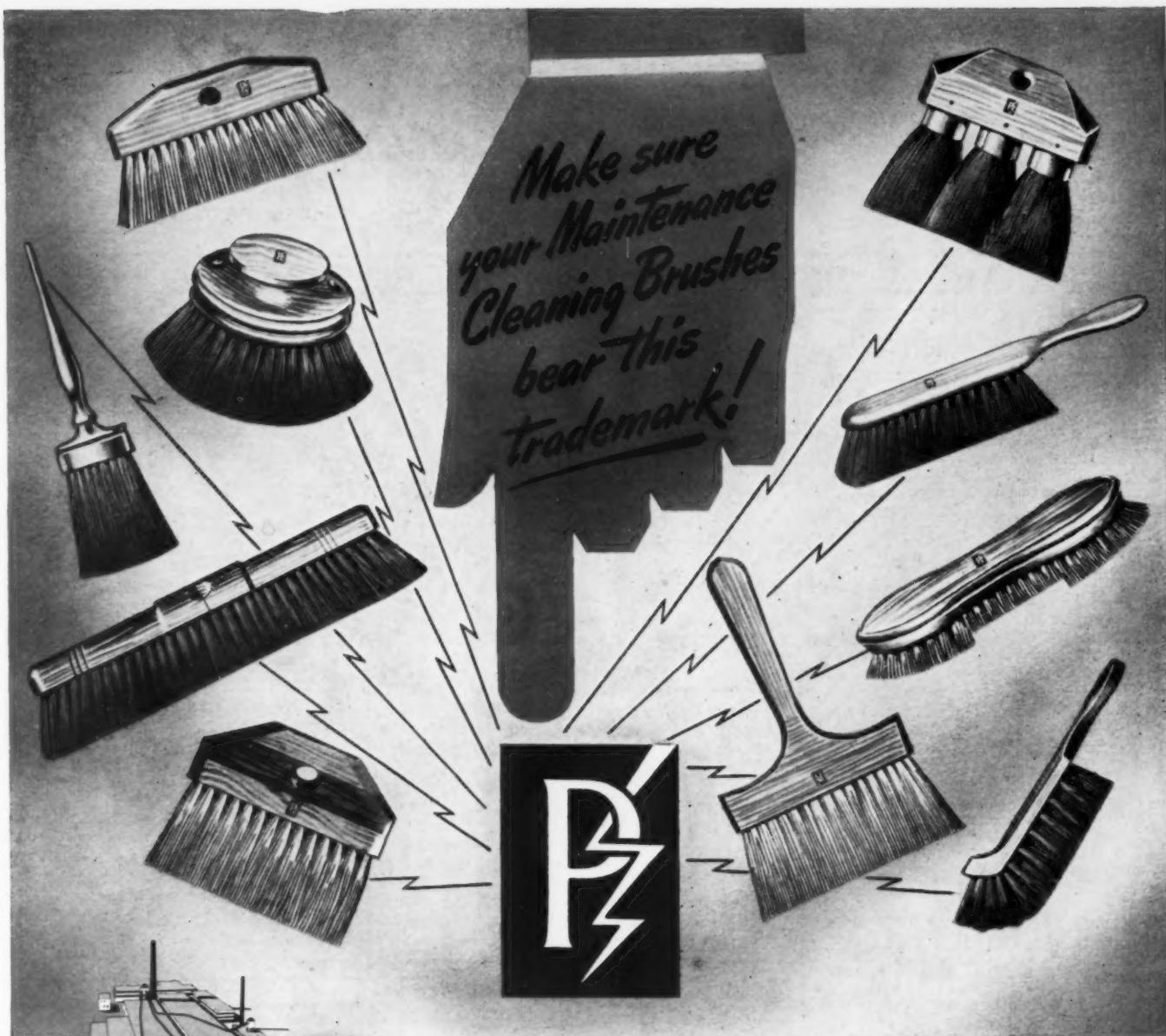
Congratulations on a great issue.

R. E. Insley
General Electric Co.
Schenectady, N. Y.

MAGNIFICENT

A magnificent editorial job!

C. B. Larabee, President and Publisher,
Printers' Ink,
New York



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Same company wants Commodity Buyer for its New York office. Age 30-35. College, good appearance, trading sense, some commodity experience, research and contact ability required. Salary to \$7,500. Box 1196, PURCHASING, 205 E. 42 St., New York 17.

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Copra, thousands of tons of this tough, dried kernel of the cocoanut to be unloaded in West Coast ports. Huge pneumatic conveyors were the answer, but the tubing used for sucking the copra out of the holds of the ships had to be flexible for changing position . . . tough and armored to withstand terrific abrasion.

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Penflex manufactures a complete line of 4-wall interlocked flexible metallic hose from $1/2$ " diameter to 30" diameter. Also, seamless welded flexible tubing from $5/32$ " diameter to 2" diameter, automatic barrel fillers, rivet passers, and hose for tar, asphalt, laundry presses, steam, diesel installations, etc. We offer our engineering service and products to improve your production. For further information on the above case of unloading write to . . .

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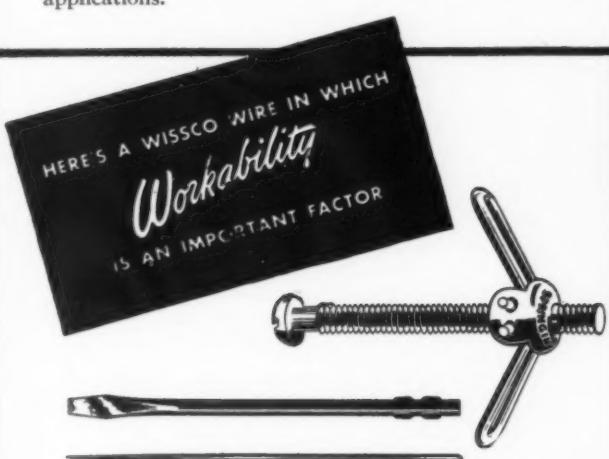
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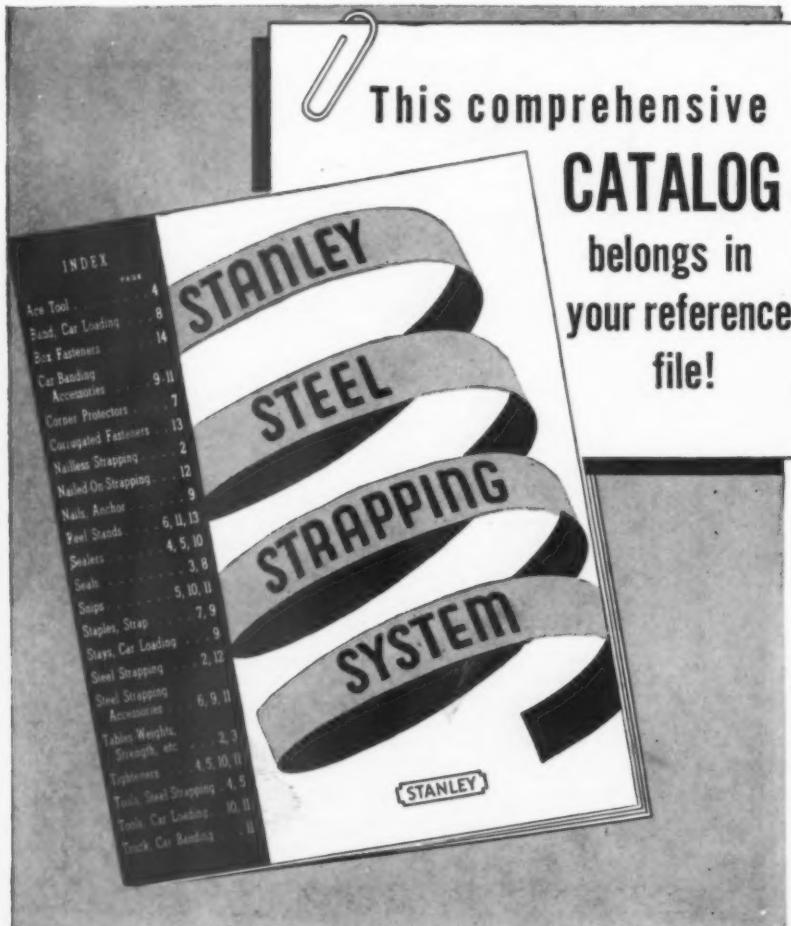
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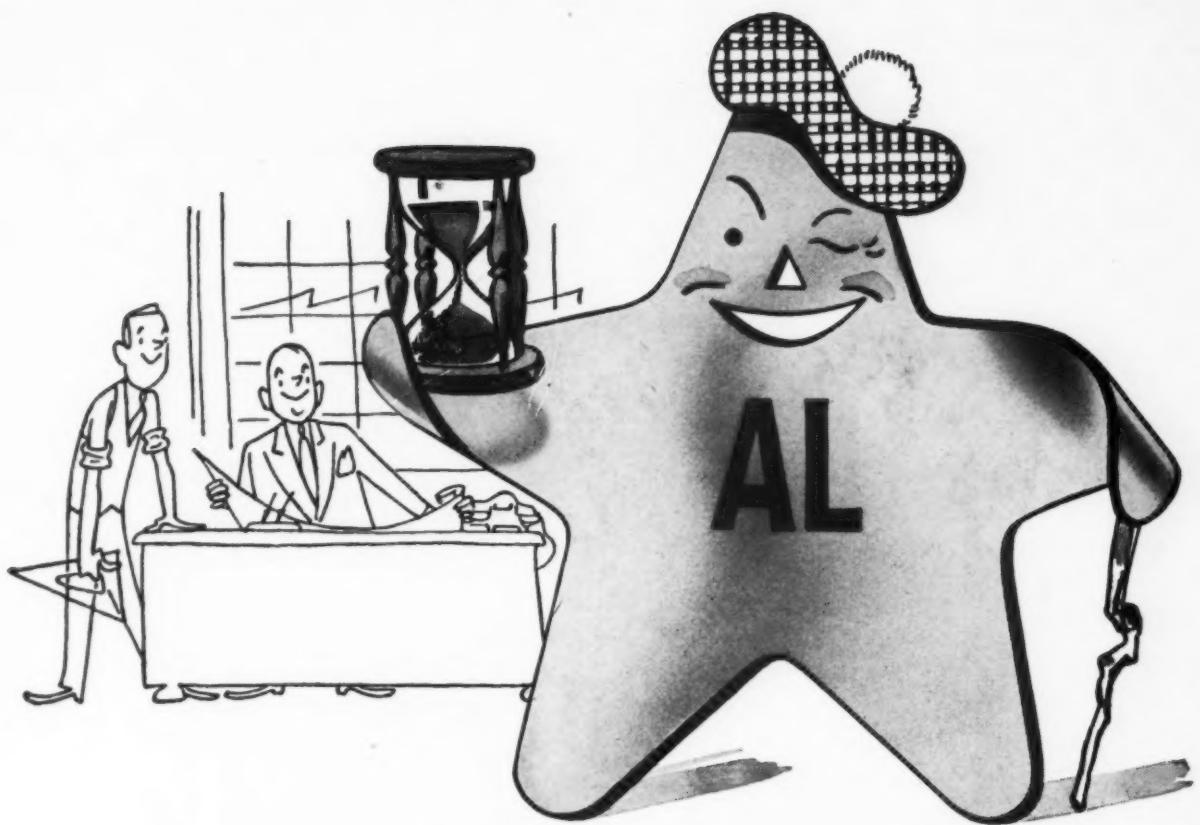
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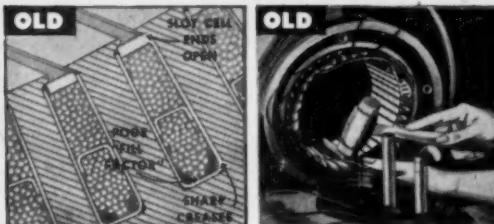
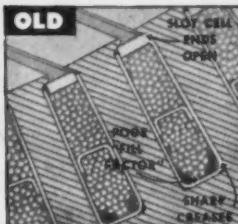
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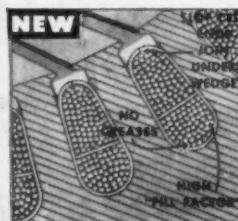
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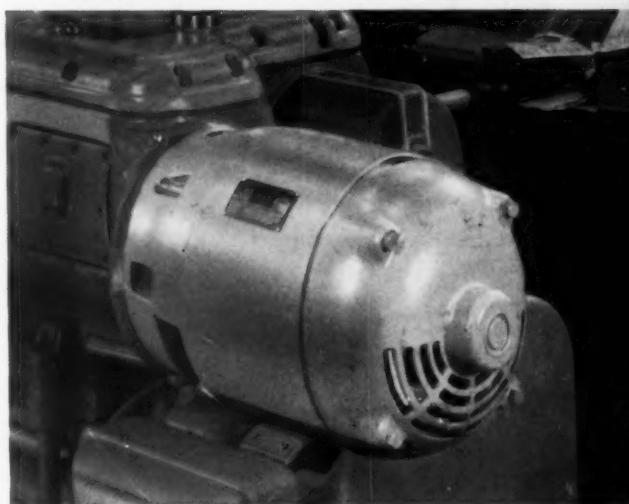
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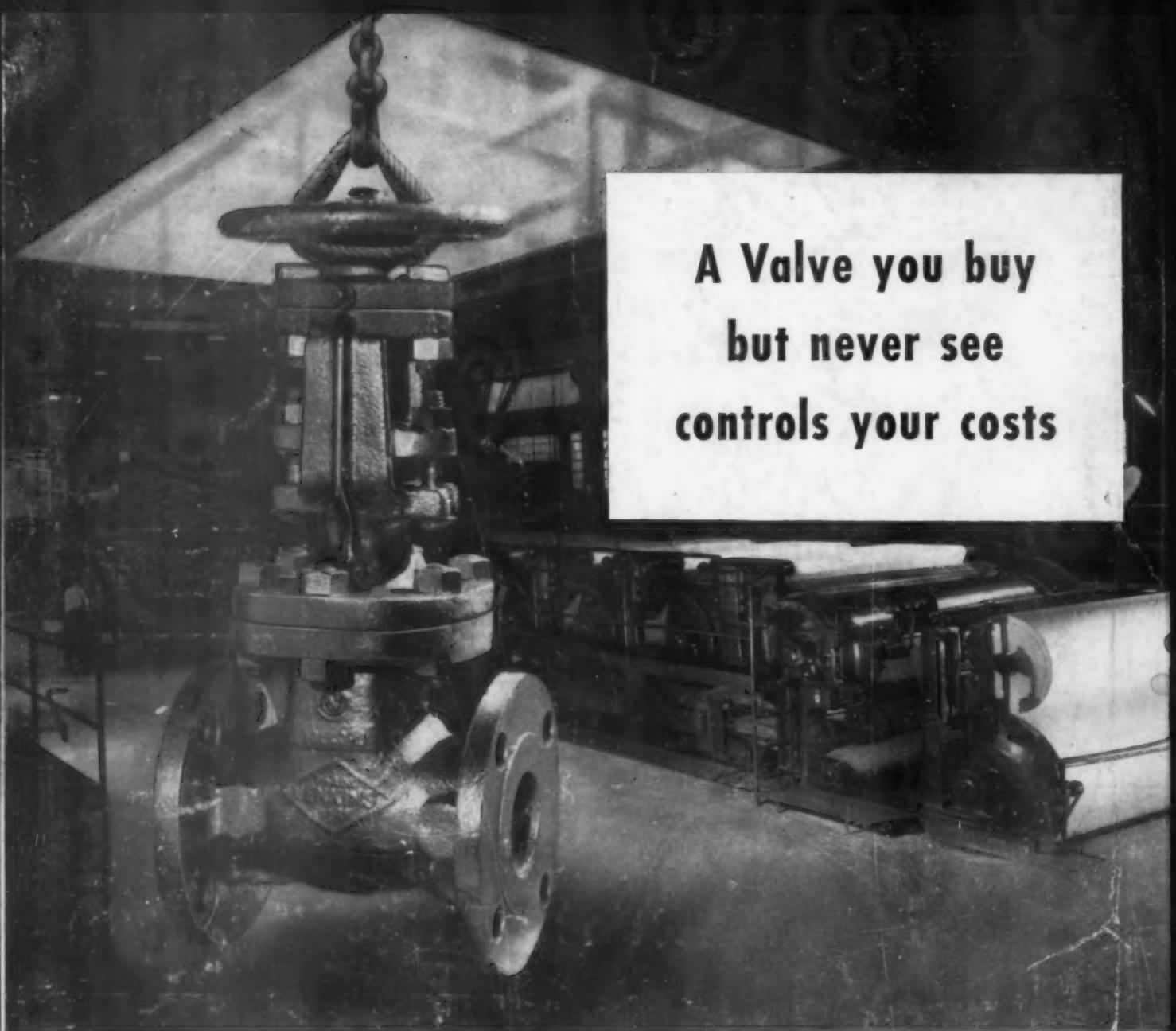


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